

July 1944

TECHNOLOGY REVIEW

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technology review

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ELMER SZANTAY, M. E. '35 - General Manager

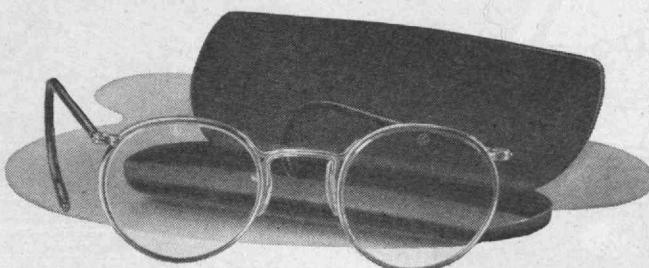
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THE TECHNOLOGY REVIEW, July, 1944. Vol. XLVI, No. 9. Published monthly from November to July inclusive at 10 Ferry Street, Concord, N. H. Publication date: twenty-seventh of the month preceding date of issue. Annual subscription \$3.50; Canadian and Foreign subscription \$4.00. Entered as second-class matter at the Post Office at Concord, N. H., under the Act of March 3, 1879.

THIS IS THE VOICE OF FRANCE



Instead of the silvery Seine—the murky Congo. Instead of well-tended fields and spotless villages—African jungle. Instead of a nation of Frenchmen—a handful of over-worked technicians and hundreds of African natives.

Yet here, three hundred miles up the Congo, is the true voice of France. Here at Brazzaville a gallant group of Free French brought in American equipment and erected one of the most powerful short-wave transmitters in the world. Every hour of the day, the voice of Free France thunders from Brazzaville, speaking in twenty different languages—spreading truth among the conquered peoples of the world—sending bulletins to the Free French fleet.

This tiny outpost is one of the most important voices of France—and Freedom—in the world.

H.R.O. receivers are standard equipment used exclusively in this station for monitoring and rebroadcasting. Brazzaville is the Voice of France, and these receivers are the Ears of Brazzaville.



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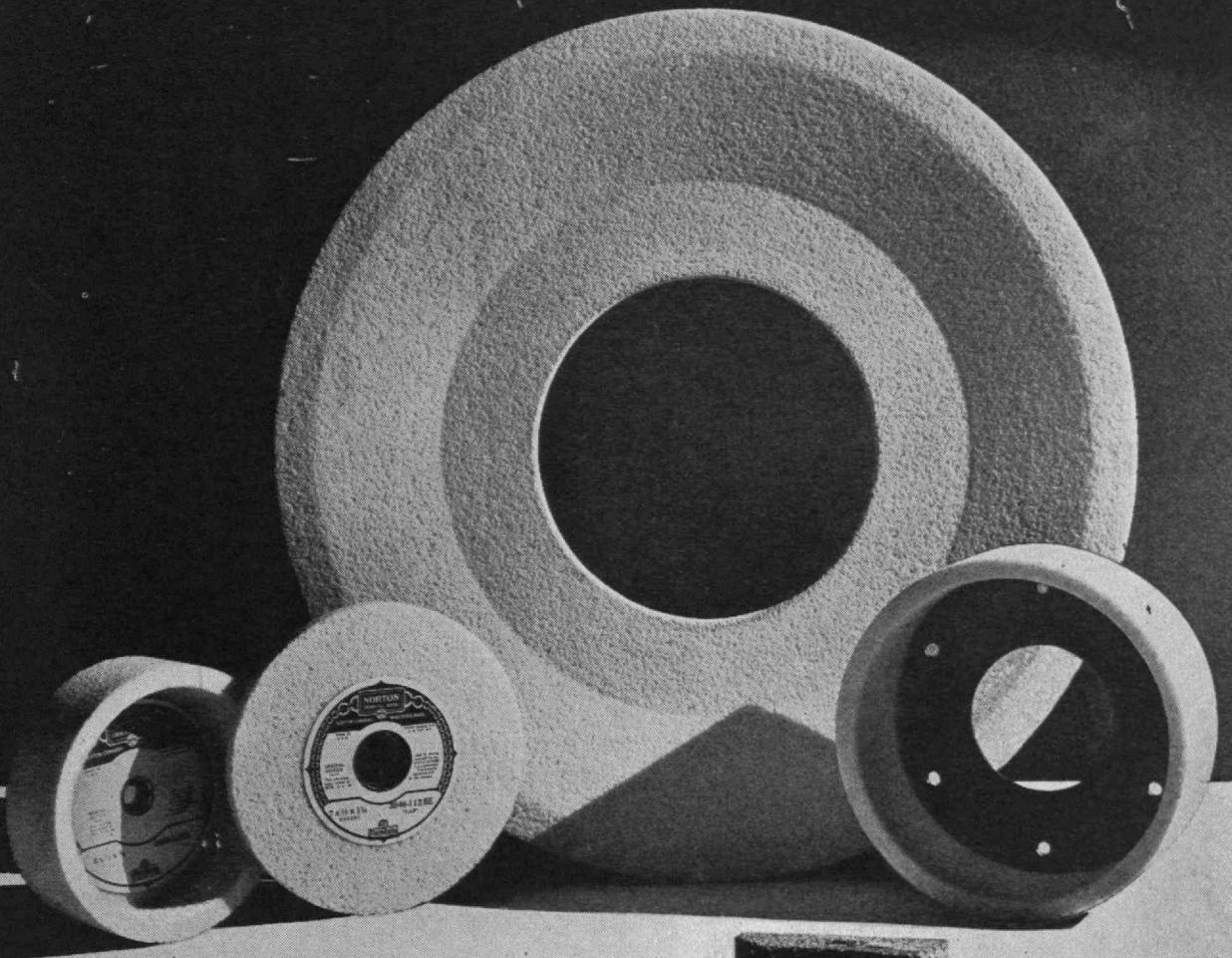


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NATIONAL RECEIVERS ARE IN SERVICE THROUGHOUT THE WORLD

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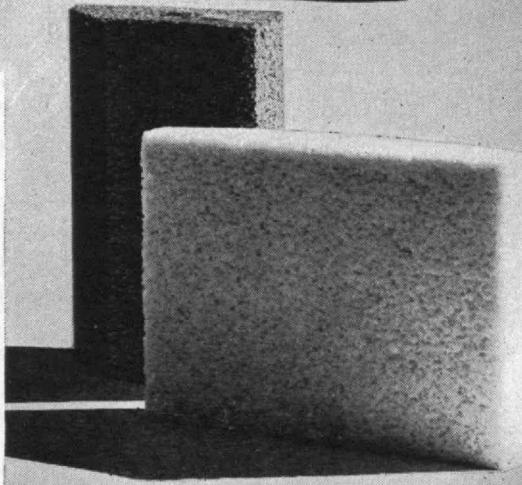


Industry now need not be handicapped by size limitations on grinding jobs that require open structure wheels—where the contact is broad—where the stock removal is especially heavy—where extra coolness of cut is essential.

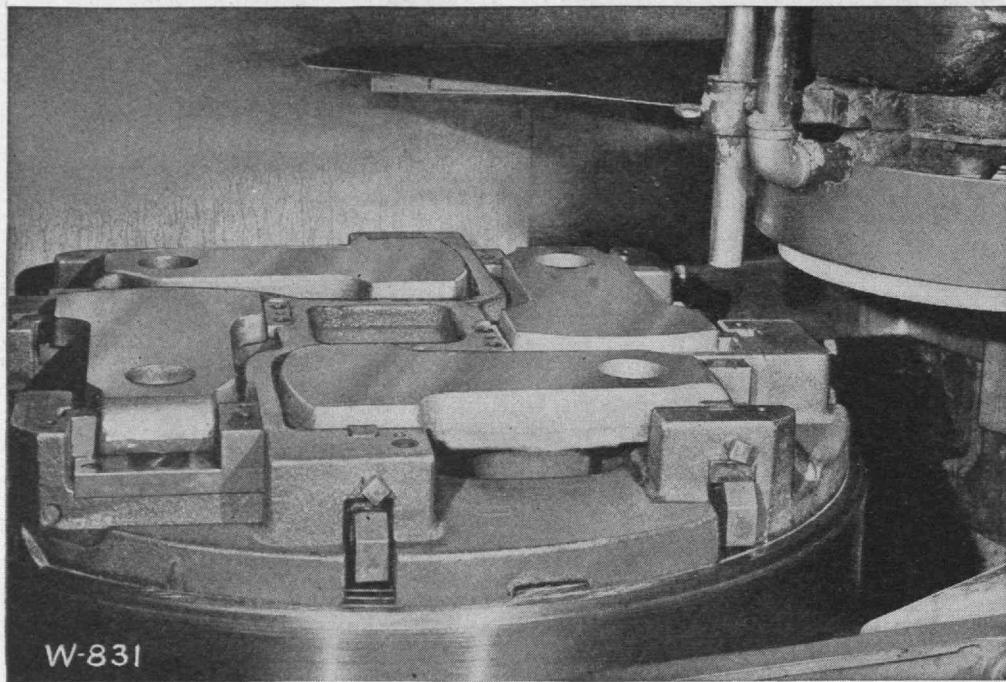
Norton Open Structure Wheels are being supplied as large as 24" diameter by 4" wide and 20" diameter by 6" wide—and, of course, in all the usual tool room and surface grinding sizes and shapes, including segments.

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Material Saving

Fine Finish

★Flatness

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★Production

★Flatness

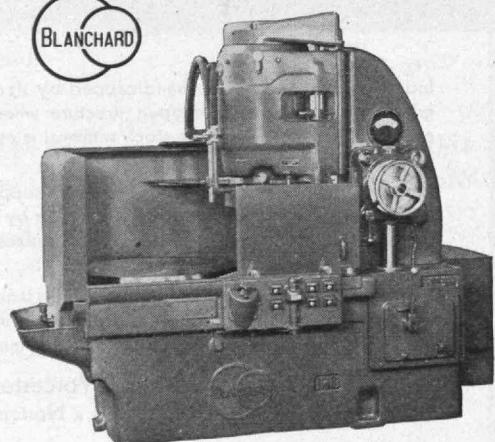
Crankshaft Cheeks ground from the rough

These crankshaft cheeks of tough alloy steel are ground from the rough forging removing .080" stock from the surface at the rate of 12 pieces per hour.

This job is typical of many production jobs in which the Blanchard grinds the first surface on the rough casting or forging, making a dependably flat surface from which all later operations can be located.

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Send for your free copy of "Work Done on the Blanchard." This book shows over 100 actual jobs where the Blanchard Principle is earning profits for Blanchard owners.



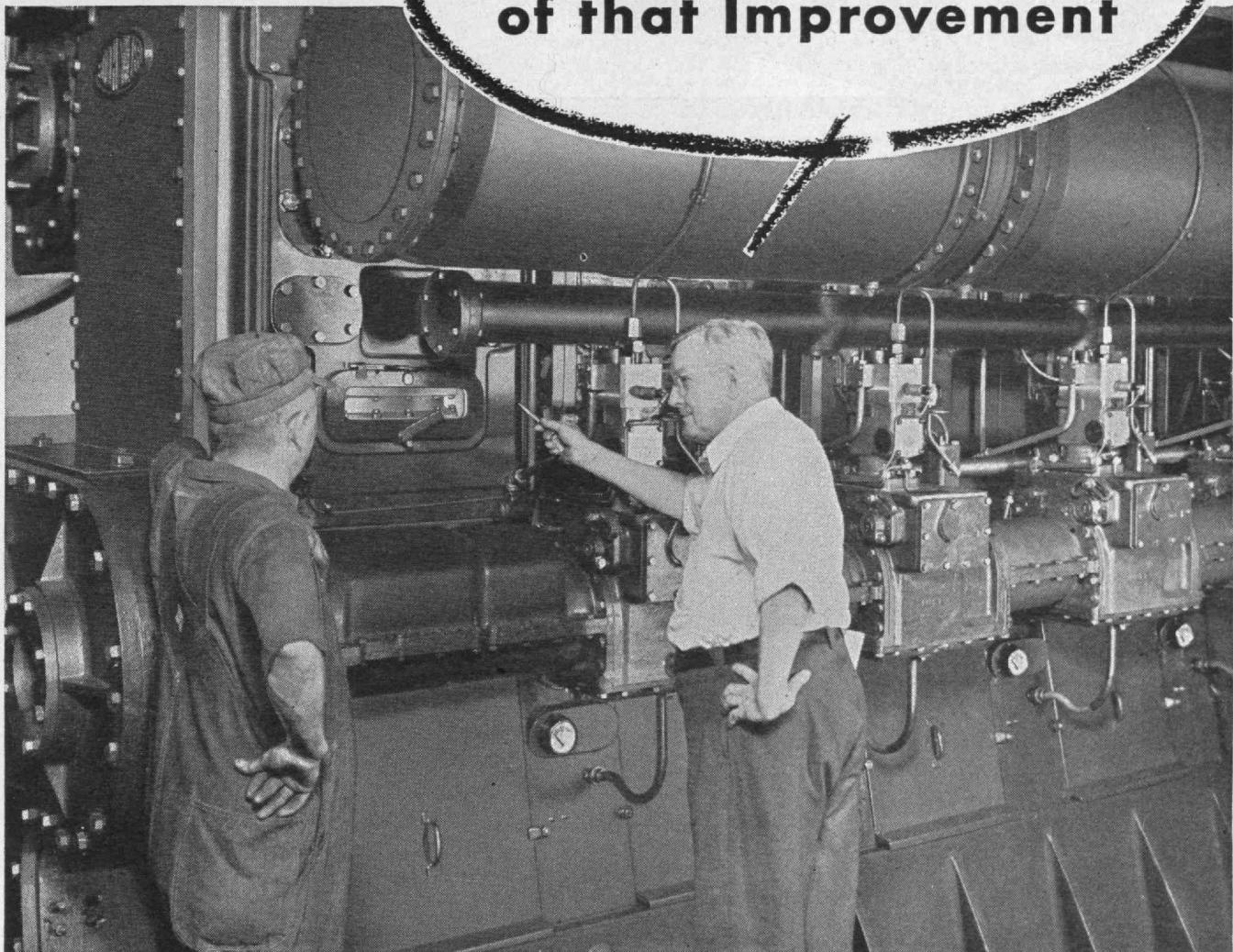
This job being done on the
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"But these big fellows have proved themselves year in and year out, Jim. We can honestly say that we have built Diesels that built Busch-Sulzer's reputation."

Busch-Sulzer Diesels are simple, dependable and long-lasting. In improving its product constantly for over 45 years, America's oldest builder of Diesel engines has striven always for simplicity of design. As a result, a Busch-Sulzer Diesel offers maximum continuity of operation with a corresponding minimum of time lost on inspection and maintenance.

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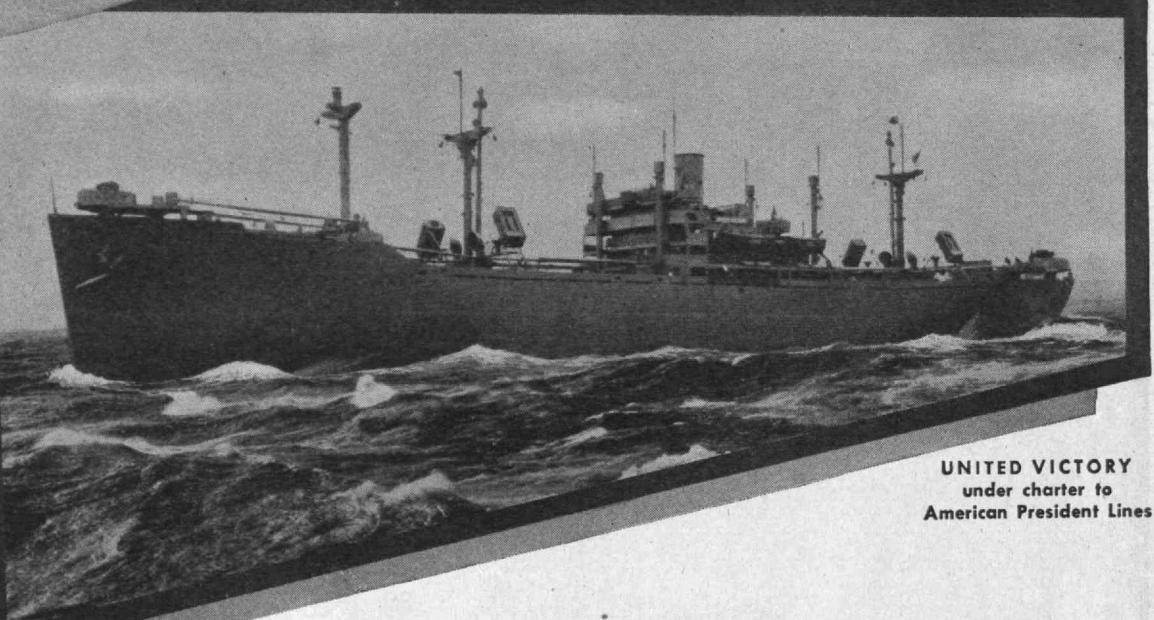
gines in sizes 225 BHP to 1500 BHP, in super-charged and un-super-charged types, suitable for marine or stationary use. A request on your letterhead will bring particulars.



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As a result, they meet the requirements of the Armed Forces for fast ships to deliver troops and supplies to every theater of the war, and are destined to become the backbone of our peacetime Merchant fleet.

The list of their names reads like a roll call of the Allied Nations: United Victory,

the first to be completed, was launched after only 55 days on the building ways and was followed by the Czechoslovakia Victory, China Victory and the Poland Victory. The first four ships* were all delivered well ahead of schedule.

Deep in their hulls, and in many of those to follow, are powerful Combustion Engineering Boilers, giving them the speed and reliability so vitally needed to make them truly the ships of Victory.

*United Victory, Czechoslovakia Victory and Poland Victory — built by Oregon Shipbuilding Corporation, Portland, Oregon. China Victory — built by California Shipbuilding Corporation, Wilmington, California. A-784

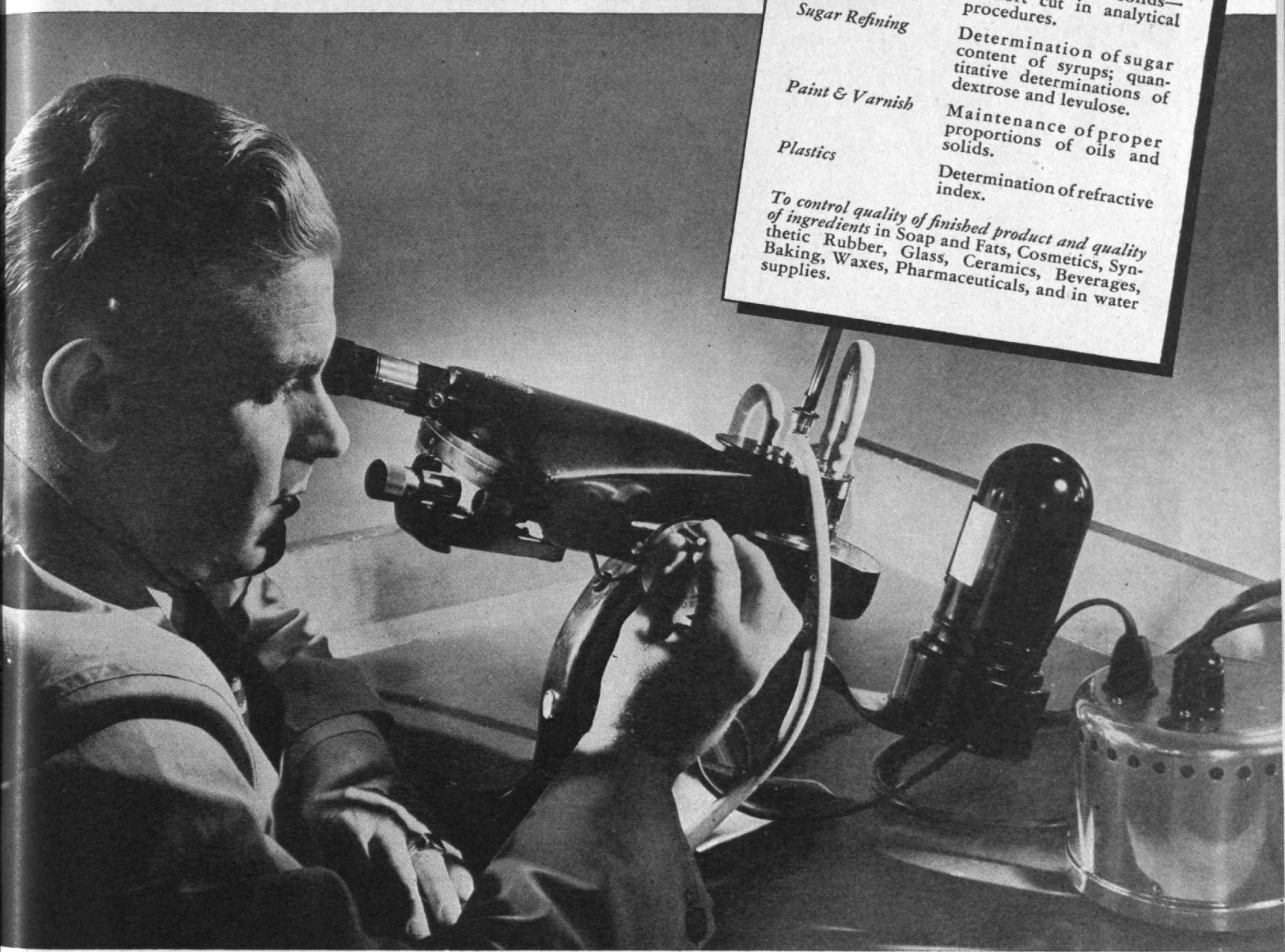


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Where Can You Use a Precision Refractometer?

Will there be a place in your post-war operations where a B&L Precision Refractometer can help you do a better job . . . or, if you are doing essential war work, is there a place where you could use one to advantage now?

The B&L Precision Refractometer is an instrument of permanent accuracy and superior design. Operation is simplified by the small quantity of liquid required, quick temperature regulation and by a minimum of moving parts. The absence of compensator and bearing errors enables readings to 0.00003 for the C, D and F lines,

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TOOLS**

THE TABULAR VIEW

Unbidden Guests. — Too much of the work which man does goes for the support of ubiquitous and ingenious beasts who have been his fellow travelers for many generations. Discussing these unbidden guests (page 543), CHARLES H. BLAKE, Associate Professor of Zoology at the Institute, explains also some of the steps constituting a proper campaign for control of them. A graduate of Technology in 1925, Professor Blake has been a member of its staff since 1924.

Oil Finders. — Requirements for petroleum, the reserves available to meet them, and methods of prospecting to augment those reserves are recounted from the point of view of firsthand experience in the field (page 546) by ROLAND F. BEERS, President of the Geotechnical Corporation. Dr. Beers, an Alumnus of the Institute as a master of science in 1928, received the doctorate last year. He has made many geophysical surveys for oil companies and is a thoroughgoing student of the subject.

True Teaching. — The rightful aims of education are analyzed (page 549) from a new point of view in an essay drawn from an address delivered by B. EDWIN HUTCHINSON at a meeting of teachers and industrialists in Detroit. A member of the Institute Class of 1909, former President of the Alumni Association, and term member of the Institute Corporation, Mr. Hutchinson is chairman of the finance committee of the Chrysler Corporation.

Southward. — From NEILL JAMES, whose earlier reports of vagabonding have pleased Review readers, comes an account (page 551) of some of the interesting sights which travelers of the future along the Pan American Highway may expect to see. Miss James is at present at work in Mexico.

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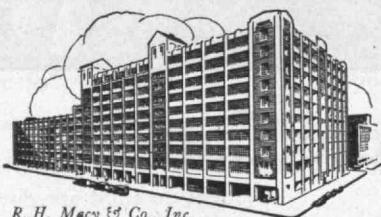
LUCIUS T. HILL '17

RAYMOND STEVENS '17

ALBERT C. SHERMAN, JR. '14

The Review is not published during the summer months following July. This issue, therefore, concludes Volume 46. Number 1 of Volume 47 will be published on October 27 and dated November. Readers who bind their copies are reminded that if they possess nine issues of Volume 46, their files are complete. An index to the volume will be ready on September 30 and will be supplied post free upon request.

**Speed with
Economy**



R. H. Macy & Co., Inc.
Warehouse (11 contracts)

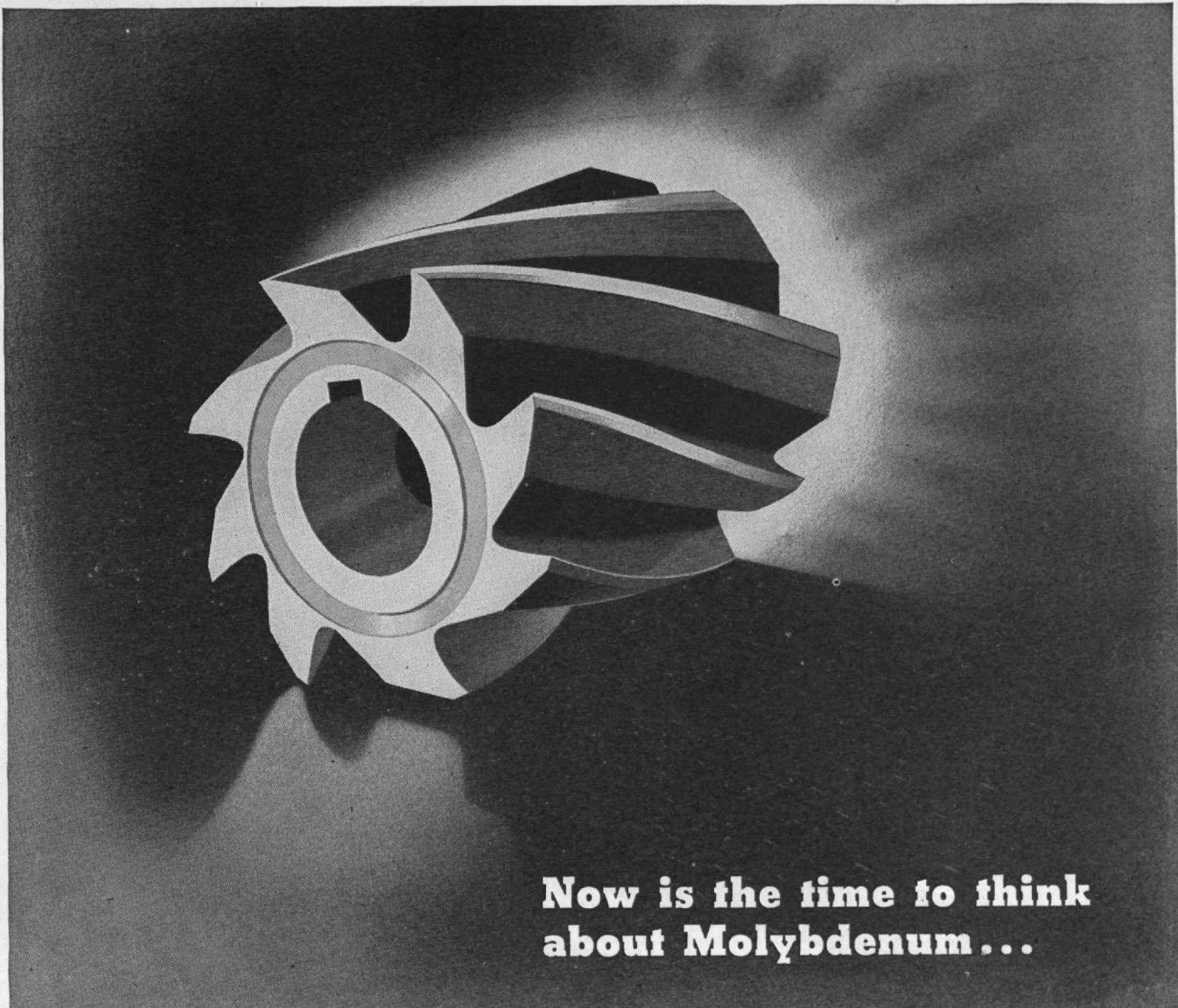
Sound construction, speed, economy — have made 100% of our present contracts repeat orders. Something to remember when you need a new building.

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INDUSTRIAL CONSTRUCTION

Alfred T. Glassett, '20, Vice President



Now is the time to think about Molybdenum...

It is generally appreciated that the item of perishable tool costs is an important factor in manufacturing accounting. The possibility of savings offered by using molybdenum high speed steels, instead of tungsten types, is therefore worth consideration.

The savings are due first to the lower cost per pound of molybdenum steels, and second to their lower density. The latter results in more tools from an equivalent poundage.

The net savings effected naturally depend on tool performance. It is an established fact that, in a substantial majority of careful comparative tests made in the past, the performance of properly heat-treated molybdenum steels equaled, where it did not better, that of tungsten steels.

A consultation with your supplier should confirm these statements, but it would be a simple matter to check them in your own plant.

CLIMAX FURNISHES AUTHORITATIVE ENGINEERING DATA ON MOYBDENUM APPLICATIONS.



MOLYBDIC OXIDE, BRIQUETTED OR CANNED •
FERROMOYBDENUM • "CALCIUM MOYBDATE"

Climax Molybdenum Company
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who dares to talk to them about a

THIRD WORLD WAR?

They were at Tarawa.

Many of them now wear empty sleeves, or bandages where their eyes were. And a thousand and twenty-six will rise up never from the sands of Tarawa Island.

They couldn't hear it. In the roar of that tornado, as they fought and fell, so far from the hills of home, they couldn't hear the words: ". . . history repeats . . . and what will we get out of it but . . . how the hell can we police . . . the next one will be against . . . already sowing the seeds for . . . and twenty years from now, brother . . . the Third World War . . ."

In elevators, on the street, in plush chairs that let you down easy, in columns and editorials and from the political stump.

What is the matter with us? Can't we at home at least go into peace with some spark of their courage and determination that this war is not another mockery, not just another World War? Let no man give voice to that weak and deadly cynicism. Let him stand up and think straight and have the courage to call the lie to any man in public or private life who fails to do the same.

And let each of us do everything humanly possible to help win this war sooner . . . buy War Bonds—give blood—boycott the black market . . . and plan ahead now for a better America than we had before.

Today, the engineers of the machine tool industry can greatly help the post-war planners of government and business management. One of these is a Bryant man . . . We invite you to send for him.



BRYANT CHUCKING GRINDER COMPANY

SPRINGFIELD, VERMONT, U.S.A.



THEY FLY TOGETHER

AT HIGH ALTITUDES—six or seven miles up—oxygen and men must fly together. With oxygen, a plane's crew can live for hours at great heights.

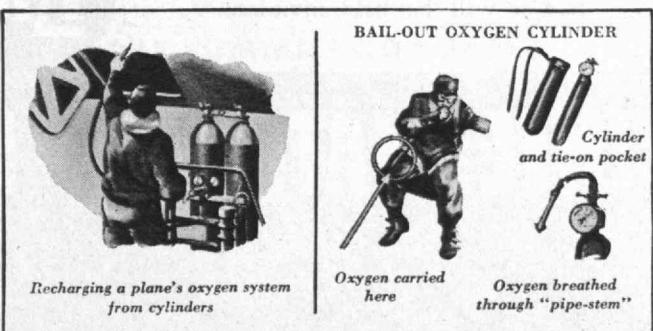
To help guarantee safety, flying oxygen must be especially dry. There must not be even so much as a tiny drop of moisture present to freeze and cut off the life-giving supply of oxygen.

Medical knowledge of oxygen was established long before high-altitude flying became so important. Through scientific research, physicians had found how much oxygen the body needs and what happens when there isn't enough. They found at what altitudes supplementary oxygen becomes necessary and how to administer it.

Co-operating with these scientists, THE LINDE AIR PRODUCTS COMPANY did much to encourage these investigations. Long before the war, this UCC Unit had so mastered the techniques of oxygen production that even its oxygen for industry met the established requirements of purity for human consumption.

Today, this medical and engineering knowledge of oxygen is giving all our fighters a better chance of coming home. Oxygen also is being used for treating pneumonia—and for shock due to wounds, burns, injuries, or following surgery.

Military and civilian physicians are invited to send for "Oxygen Therapy News" P-7, which is published periodically to make available information on significant reports in current medical literature concerning the therapeutic use of oxygen. There is no obligation.



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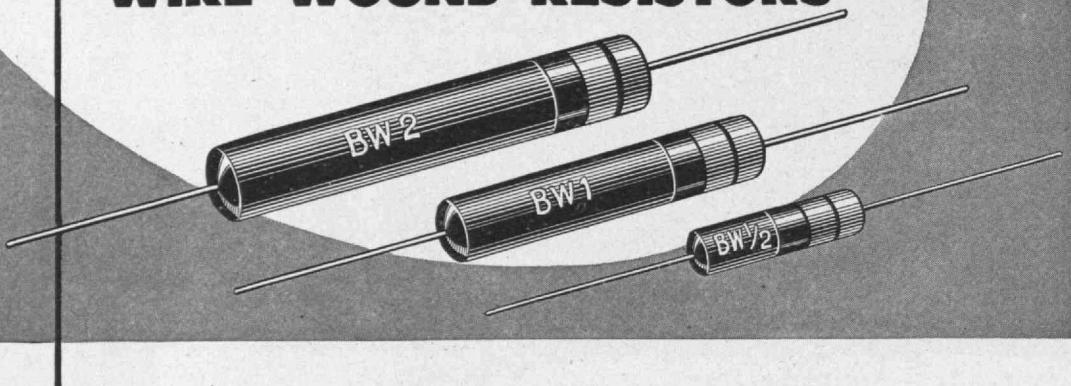
PLASTICS

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**with TYPE BW INSULATED
WIRE WOUND RESISTORS**



At the first indication of lessened demand by the Armed Services, IRC will be in an excellent position to immediately supply industry's requirements for resistors of all types. That IRC units will be available in ample quantities on a favorable price basis is assured because we have developed and are operating on a mass production basis the world's largest resistor plants.

RESISTOR PROBLEMS WELCOME

Feel free at all times to consult with us on your peacetime product design plans involving resistances. You can be certain of unbiased engineering counsel and secure in the knowledge that the subject matter will be held inviolate.

CHECK THESE FEATURES OF TYPE BW WIRE WOUND RESISTORS

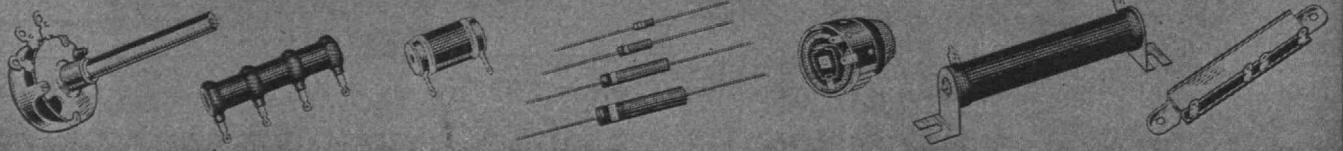
1. Completely insulated wire wound of standard $\frac{1}{2}$, 1 and 2 watt sizes.
2. Resistance values: $\frac{1}{2}$ watt—from .24 ohms to 800 ohms; 1 watt—from .5 ohms to 5000 ohms; 2 watt—from 1.0 ohms to 8000 ohms.
3. Have wire wound stability and are physically interchangeable with carbon types.
4. Available in matched pairs to 1% or 2% for close-tolerance, high-stability applications.
5. Element is space wound with copper-nickel or nichrome bare wire securely crimped and molded integrally with leads.

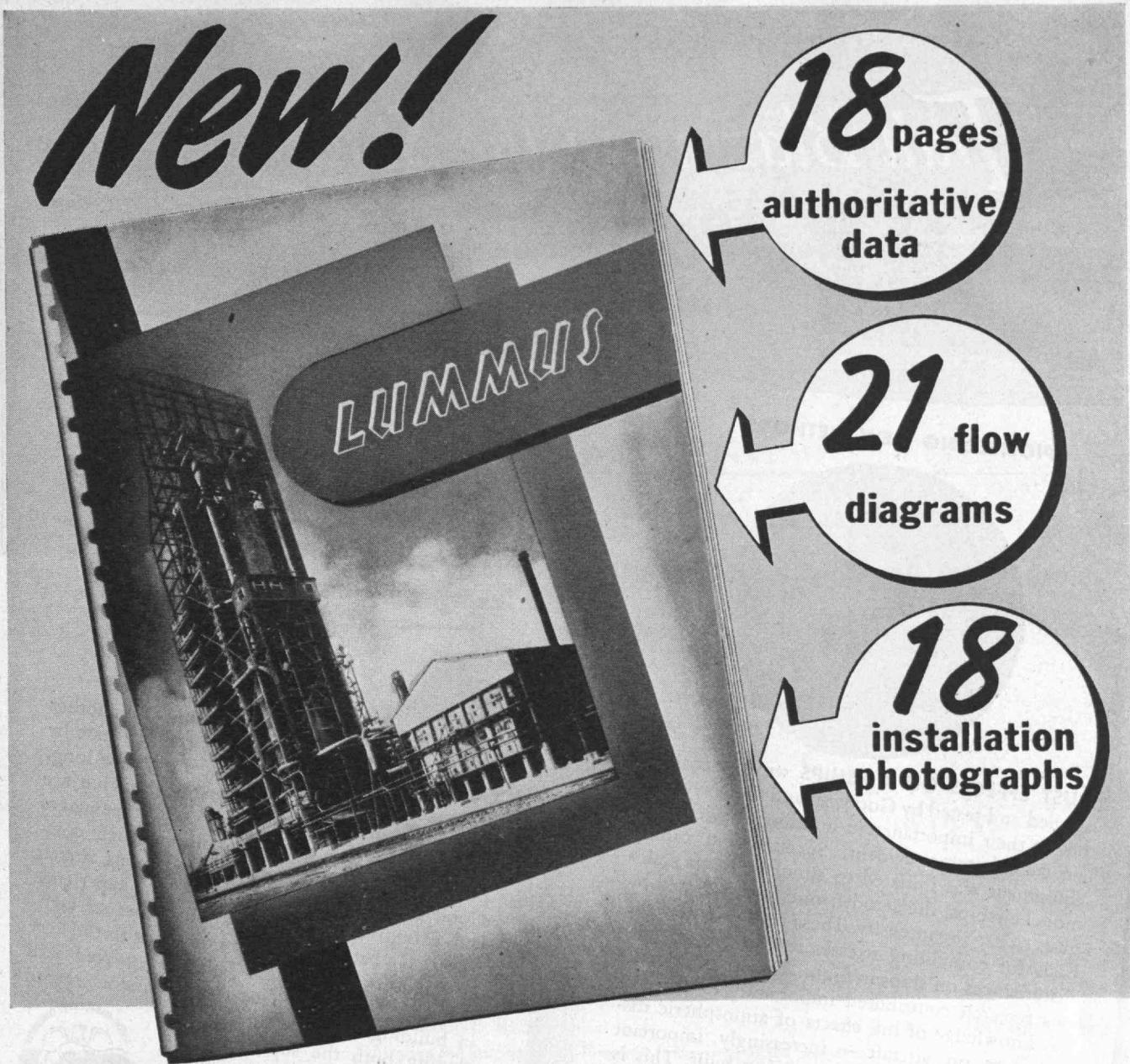


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IRC makes more types of resistance units, in more shapes, for more applications than any other manufacturer in the world.





► "Petroleum Refining Processes," Bulletin R-8

Bulletin R-8, just off the press, offers you 54 pages of technical text and data, flow diagrams and photographs that are not only authoritative — but timely.

Described are Thermofer Catalytic Cracking*, Houdry Catalytic Cracking*, Polyform and Gas Reversion, Alkylation, Isomerization and other processes for the production of 100 octane gasoline, aviation lube oils, butadiene and styrene for synthetic rubber, and many other important post-war refining processes.

Flow diagrams also cover combination cracking, viscosity breaking, delayed coking, gas concentra-

tion, propane deasphalting, furfural refining, solvent dewaxing, tannin solutizer sweetening, and other processes utilized in plants designed and built by Lummus. Bulletin R-8: "Petroleum Refining Processes" is ready for mailing. Write for a copy.

*Licensed by Houdry Process Corporation.

THE LUMMUS COMPANY

420 Lexington Avenue, New York 17, N. Y.

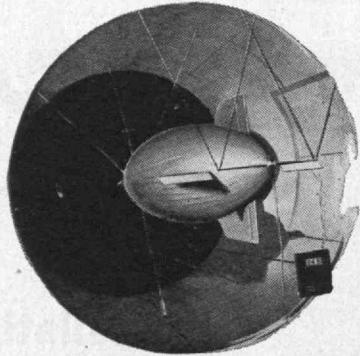
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L U M M U S

P E T R O L E U M R E F I N I N G P L A N T S

Trail Blazing in the Skies

PIONEERING NEW METHODS

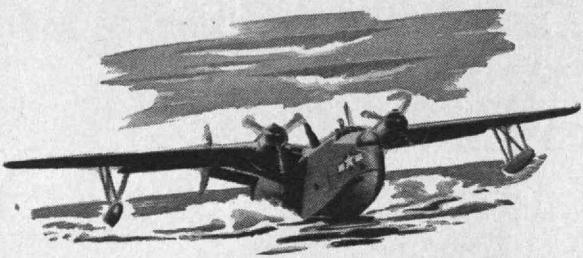


GUST EFFECTS ON AIRSHIPS were extensively studied and tested by Goodyear and the Navy long before their importance in building heavier-than-air craft became evident. Special wind tunnel equipment was initiated to simulate, upon scale-model airships, the aerodynamic forces created by gusts of varying intensity. These tests provided the basis for computing stresses resulting from gust disturbances on ships in flight. This long and tedious research contributed importantly to present-day knowledge of the effects of atmospheric disturbances on aircraft — increasingly important today as larger airplanes are being built. This is another example of the breadth of Goodyear's background in aircraft development.

HOW GOODYEAR AIRCRAFT CORPORATION SERVES THE AIRCRAFT INDUSTRY

1. By constructing subassemblies to manufacturers' specifications.
2. By designing parts for all types of airplanes.
3. By re-engineering parts for quantity production.
4. By building complete airplanes and airships.
5. By extending Goodyear Research facilities to aid the solution of any design or engineering problem.

BUILDING PROVEN AIRCRAFT PARTS



THE FAR-RANGING MARTIN PBM-3 is another of America's dependable planes built in part by Goodyear Aircraft. Large numbers of these long-distance patrol bombers now in service are equipped with ailerons, flaps and empennages fabricated by Goodyear. In building such components for the PBM-3 and other famous aircraft Goodyear has the advantage of its long experience and extensive research in all branches of aeronautics — a background that goes back to the very early days of aeronautics. This time-proved skill is further attested by Goodyear's standout record in building complete aircraft, including both the superb Corsair fighter and naval patrol airships.

BUY WAR BONDS • BUY FOR KEEPS

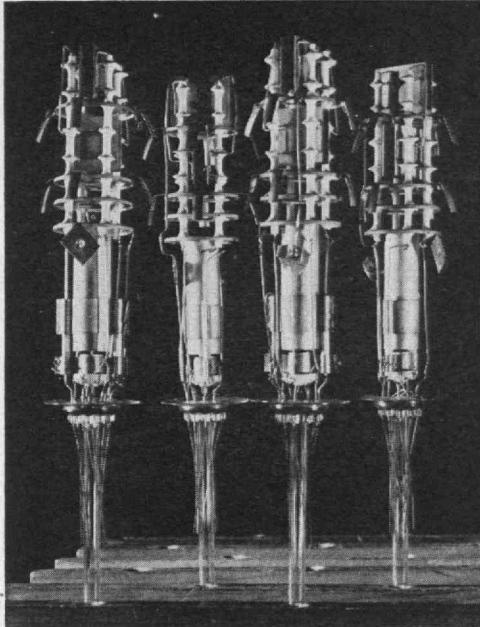


THE TECHNOLOGY REVIEW

TITLE REGISTERED U. S. PATENT OFFICE

EDITED

AT THE MASSACHUSETTS INSTITUTE OF TECHNOLOGY



F. S. Lincoln, '22

Ballet: Cathode ray tube elements wait in a rack before being sealed in their glass envelopes at a plant of North American Philips Company.

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From a photograph by Fritz Goro

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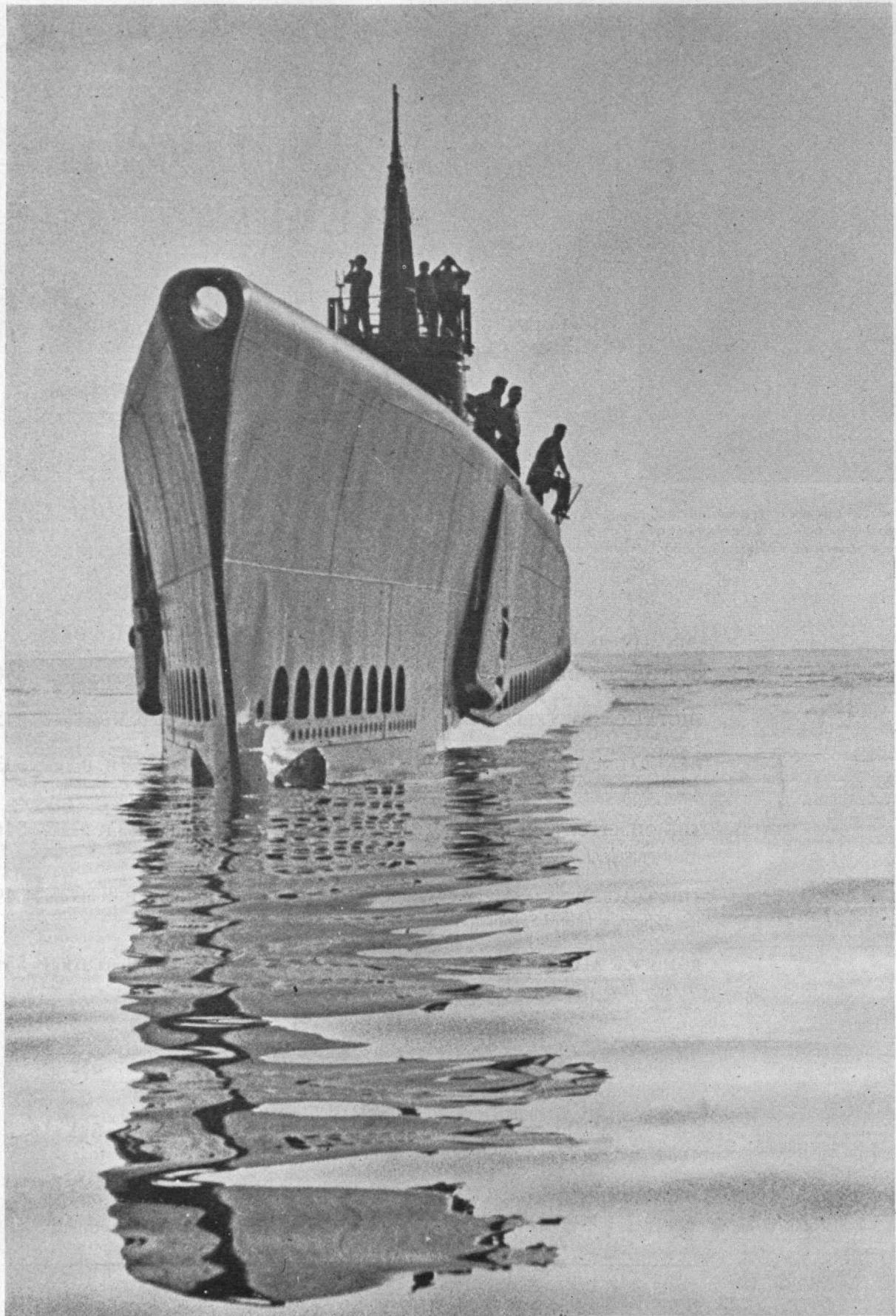
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Official United States Navy Photograph

Out of the Deep

THE TECHNOLOGY REVIEW

Vol. 46, No. 9

July, 1944



The Trend of Affairs

Wings After War

APPRAISED imaginatively and speculatively, aviation in the years immediately following this war is a wonderful wonderland through and above which Mister Public flits in his personal helicopter, shifting to roaring jet-propelled stratosphere ships for longer jaunts, skittering from place to place on the planet at will and at bargain rates. Such appraisals have glamour, if nothing else.

They have unglamorous characteristics, too, in that they easily lead to false expectations and hence to dubious prospects for public acceptance of what aviation is much more likely to be in the early postwar years. Appraised objectively and with a shrewd eye to economics and engineering, the future of aviation is seen to be tremendous in potentialities but subject to laws of growth not very different from those governing other industrial undertakings.

It is an appraisal of this second and very important kind which Lieutenant Commander S. Paul Johnston, '21, makes in *Wings After War*.^{*} As readers of The Review have good reason to know, Mr. Johnston discusses aviation with all the interest and enthusiasm of a firm believer in what it is and can do but with the hard-headed common sense of one who has been closely concerned with its economic and engineering development over a long term of years. In this pungent volume, as in his articles for this magazine, his effort is to insure sound and untrammeled growth for aviation by safeguarding it against inflated and unstable anticipations.

Holding that the utility of the ordinary light plane is about the same as that of a motorboat of equal power and cost, Mr. Johnston reasons that the time has not yet arrived for the ocean of air that washes Everyman's doorstep to be made usable at the doorstep. Flying must be made simple enough and cheap enough to be indispensable to a large number of people. That Mr. Johnston believes

it will be is implicit; he argues convincingly, however, that the process demands more time.

So it is with other aspects of probable postwar trends analyzed in other chapters of the volume — passenger travel, freight hauls, methods for the continued fostering of the skills in military aviation which the war has built up, the problem of disposing of the vast pool of aircraft which will be on hand when the war ends, and, germane to this last, the crucial question of government policy, on which the future of aviation as an industry hinges.

The upshot of any book such as this could easily be a very gloomy one. That this is not true of Mr. Johnston's volume is owed to the fact that he concludes with cogent argument for planning, for the furtherance of research, for devotion of talent "to consider the wave of the future before it engulfs us."

Rolling Stock

SAVING 20 per cent in weight and allowing a slight increase in inside capacity, the first of a group of special four-wheeled railway cars for use in passenger trains has recently gone into service in England. Reinforced plastic sheets made of high-tensile steel wire and cotton mesh impregnated with synthetic resin under heat and pressure are used in the bodies of the cars, which were designed so as to employ the largest sheets at present available, six feet six inches by three feet three inches in dimension. In the manufacture of the sheets, 24 wires and threads are used to the inch and are woven so as to be interlocking. The material has an ultimate tensile strength of 12 tons to the square inch in each direction.

The body of the cars is separated from the frame by a spring cushioning system which permits the body to move longitudinally several inches under the influence of service shocks. The body frame is constructed of light channel sections, welding being used to fasten them to the rolled channels which compose the floor framing. The under-frame is of cantilever design, built up by fabrication as

* New York: Duell, Sloan and Pearce, 1944. ix + 129 pages. \$2.00.

far as possible. Total weight of the car is 10.2 tons as compared with the 13 tons of similar vehicles of standard design.

Dictation by Telephone

BY DAVID O. WOODBURY

OF the millions of letters a day dictated by countless businessmen, a generous proportion are talked into dictation machines and later transcribed by stenographers. Modern dictation machines do a quick, neat job with the minimum of bother to the busy executive. Yet in large firms where there is much writing of letters this system may easily involve annoyance and economic loss which the machines themselves cannot overcome. This is because every executive must have his own machine ready to hand at all times, although he may not use it more than two or three times a day. The load factor under such conditions may be very poor — perhaps 10 per cent or less.

A large New York firm, for instance, has more than 600 dictating machines scattered about in as many offices. Squads of "runners" go around once an hour collecting wax cylinders and taking them to the stenographic bureau. Even if a record is unused, it must be inspected. This means some 4,200 invasions of private offices by subordinates who cannot help interrupting the occupants.

Henry P. Clausen has just patented a system designed to avoid this nuisance and improve the load factor to the theoretical limit. His scheme provides for the dictation of all letters over telephone lines to a central office, where they are fed to recording machines of a new type and thence transmitted to the stenographic bureau. According to Mr. Clausen it would be possible, in the firm above mentioned, to cut the number of machines from 600 to 60, working every machine virtually all the time. The exact number of record cutters needed for any office would be determined by statistical studies of the average number and distribution of letters on a typical day. Even with proper allowance for machines out of service and for emergency reserve capacity, an improvement of about 1,000 per cent in investment and upkeep of machines would result, not to mention savings in labor and avoidance of interruptions to busy men.

The Clausen recorder is a most ingenious device. The incoming telephonic dictation is first inscribed upon a magnetic wire loop of such length that it will hold about three minutes' worth of talk. Just ahead of the point where the sound is impressed on the wire is the demagnetizer which clears it for dictation to follow. Ahead of this, in turn, is the pickup device which takes the sound to the cutting machine for inscription on thin cellulose-acetate records. Thus the magnetic device acts as a temporary reservoir between speaker and final record.

In the normal course of events, dictation is carried on steadily, the loop of wire holding what it receives for three minutes, then feeding it into the recording circuit, then wiping itself clean. If the speaker wishes to listen to what he has said in recent paragraphs, he merely presses a button on his instrument, actuating a relay which disconnects the recording pickup and the wipe-off mechanism and plays the material on the loop back to him over the telephone line. To make changes, he then actuates the demagnetizer with a second button, clears the unsatisfac-

tory remarks, and starts fresh. During such an interruption the turntable of the record cutter is stopped, so that no space is wasted. No sound track is cut until the speaker is satisfied with the language.

The system is separate from the ordinary telephone lines and has its own switchboard and operator. When an executive wants to dictate, he simply picks up a special handset and waits. The operator selects a line leading to an unoccupied recording unit and plugs in. The completed connection is signaled back by means of a green light, and the speaker goes ahead. Hanging up his phone indicates on the board that he is finished, and the operator pulls down the connection. A ticketing system insures that the records made will be identified with the office originating them.

Meanwhile, in the central recording room, an attendant is busy watching all machines. As records are completed, he removes them, groups them with the ticket sent him by the switchboard operator, and then sends them with other sets to the stenographic room. If a dictator fills more than one record, selector switches ganged to all machines connect one that is standing by. The attendant needs only to keep fresh records on all idle machines.

Clausen's invention also favors the stenographer with a similar double pickup device. If dictation is too fast, she can shut off the recording and play the words over and over again from the magnetic wire till she gets them. This avoids the time that would be lost in resetting the playing needle on the cut record, often difficult to do.

"Central station" dictation, besides its improved convenience, is expected to speed up letter writing and save large companies much money. An added advantage is that the records themselves, being only seven-thousandths of an inch thick, can be filed permanently in a small space for future reference. The cost of a record blank is about two cents. It will hold an hour's conversation on each side.

Cahotage

DRAMATIC improvement in cases of acute conjunctivitis treated with penicillin is reported from England, where application of the mold-produced drug is under investigation by ophthalmologists of the Royal Air Force. A drop of penicillin solution in each eye three times daily was found capable in some two weeks of clearing up inflamed, crusting, scaly lids with watery discharge, the condition having been present in some cases since childhood. ¶ Tractor-mounted shears are being used in logging operations in Texas. The shearing blades, placed around tree trunks, cut through them with one tug of the tractor, the felling operation requiring but a minute. ¶ Restriction of foreign supplies by wartime blockades has led to the development of an active pharmaceutical industry in Sweden. The refining of imported materials which to a great extent engaged the Swedish chemical industry in pre-war years has given way to the production of necessary medicinals at home. One of the prime purposes of the industry as now organized is the fostering of an export trade based entirely on production from domestic raw materials. ¶ Suburban women in Britain are reported to be spending three or four dollars a week on beauty treatments as against their average pre-war disbursement of less than a dollar in three weeks. Meanwhile in Australia, women must put their names on priority lists for six months to get cosmetics.



United States Fish and Wildlife Service

General Rattus

Possessed of Few Friends but Plenty of Ingenuity, Man's Match in Omnivorousness Continues a Problem

BY CHARLES H. BLAKE

THE rat has no friends. It is almost the only well-known pest of which nothing good may be said.

Even so, only a few other animals, notably the dog and the bear, have as great a wealth of legend associated with them as has the rat. These legends originally pertained to the black rat since even the story of the Pied Piper of Hamelin (1284) long antedates the invasion of the brown rat into Europe. Similarly, the story of the rat used as a sled by another rat in order to carry an egg goes back before the time when even the black rat was recognized as a pest, although it was known to the Greeks.

To speak of "the rat" is not strictly true. There are many kinds of rats in various parts of the world and the term is, in fact, rather a convenience in separating the larger ratlike rodents from very similar rodents which are smaller and are called "mice." In the United States, we are more or less justified in speaking of "the rat," since the only common domestic rat is the brown, or Norway, rat. In other parts of the world, other species occur which, though not always closely related, are sometimes sufficiently exclusive in an area to be thought of as "the rat." The brown rat and its allies in the genus *Rattus* furnish the most destructive of the household rodents, but they are in some respects rivaled by the closely related though much smaller house mice of the genus *Mus*. All Old World rats and mice which are common in the United States, belong to the family Muridae, whereas our common American native rats and mice belong to the Cricetidae.

Rodents are surprisingly easy to domesticate — so easy, in fact, that they tend to domesticate themselves. I suppose this arises from the fact that many of them can live in very cramped quarters such as are found within walls of a building, can go through narrow passageways, are

shy, alert, and, above all, nocturnal, and hence rarely come into actual contact with their hosts (human beings).

Rats resemble man in more than one way, and not the least of these is that both are nearly omnivorous — rats, in fact, are so omnivorous that they are much more easily baited with meat than with grain. Undoubtedly, this willingness to eat almost anything has helped adapt the genus *Rattus* to live with man. However, the characteristic must have developed long before rats were associated with man. It is strongly reflected in the structure of the digestive tract, which is shorter than that of some other types of rodents, such as guinea pigs, which are fairly exclusively vegetarian. This shortness is particularly marked in the blind pouch (caecum) which juts out from the junction of the large and small intestines. In the leaf-eating rodents, the caecum is relatively enormous, sometimes having a capacity equal to that of all the rest of the digestive tract and being as long as the small intestine.

No complete list of the domestic and semidomestic rodents of the world exists as far as I know, but we do have fairly complete accounts of *Mus* and *Rattus*. The latter genus seems to have its headquarters on the larger islands of the Dutch East Indies, where rather many wild species occur. In Sumatra, for example, there are about 30 species, but the number of species declines very rapidly east of the Celebes and north of Malaya and the Philippines. Apparently only a few of the species have become domesticated. One of these, *Rattus concolor*, is recorded from Burma to New Guinea. It seems nowhere to be highly significant. The brown rat (*Rattus norvegicus*), which is now cosmopolitan, is known by many names. It is a large gray-brown animal, although its size depends to some extent upon food supplies during growth. Hence it is often supposed that there are several kinds of brown rats. The

brown rat affords one well-marked variety, the albino rat of the biology laboratories. This is a small race which is said also to be minutely different in its structural characters from the main form and to be relatively tame. We must, in the case of these rodents, distinguish between a domestic animal and a tame animal.

The theory is that the brown rat gradually spread both eastward and westward from its original home somewhere in central Asia. Its westward spread, however, was relatively recent. The first recorded westward invasion of the brown rat was its crossing of the lower Volga in 1727, although it seems certain that it had earlier appeared, at least in small numbers, in Russia. It reached England about 1729, apparently by water because it did not arrive in eastern Germany until 1750. It first appeared in North America in 1775.

For a long time it was known in England as the Hanoverian rat since it was first observed in England during the reign of George II of the House of Hanover. Because it arrived in England so recently, we have been able to see there more clearly the relations between the brown rat and its somewhat smaller relative, the black rat, or ship rat, which is the old house rat of the British Isles. When the two species come into competition, the brown rat displaces the black rat, except in those situations in which the black rat can keep out of the way of the brown rat by climbing. The brown rat does not climb to any great extent.

The brown rat is a powerful animal, quite capable of enlarging openings in brick and poor concrete with its strong front teeth. The most recent recommendation I have seen for the flooring of chicken houses is to use four inches of reinforced concrete. This is said to be ratproof. Brown rats can easily tear open many kinds of packages, damaging much that they do not eat. Like their relatives, they make nests of fiber or shredded paper or cloth. Here the young are born and raised until the time of weaning. They become sexually mature in about two months.

The brown rat possesses surprising ability to learn how to avoid poison baits. Both the base food and the poison must be changed at intervals. Prebaiting with clean foods for several nights before use of poison baits is often needed to get good results. This rat is very trap shy.

The roof rat, *Rattus rattus alexandrinus*, is practically cosmopolitan but, unlike the brown rat, is divisible into at least eight distinguishable domestic forms, some of which are very local and others of which are found almost throughout the world. Generally speaking, it is a little smaller than the brown rat; much darker in color, sometimes practically black; and a good climber, preferring to live in the upper parts of buildings (hence the name "roof rat") and in trees. Otherwise its habits are similar to those of the brown rat, but it is generally a much weaker animal. It is characteristically the rat of ships. Three of its forms occur more or less sparingly in North America — the roof rat proper, the white-bellied roof rat, and the black rat, or ship rat.

The house mouse, as a species, is likewise cosmopolitan. Ernst Schwarz recognizes no less than 11 domestic forms of this animal. No one of these is cosmopolitan and a few have very restricted distributions. For the most part, in Schwarz's opinion, these domestic forms are accompanied by very similar wild races. This theory raises the troublesome question of the effect of domestication upon the house mouse, and there is no satisfactory answer available

at this time to my knowledge. The house mouse, like the brown rat, has a well-defined albino form, and a few other variants have been obtained. As far as I know, these are strictly identical with one or the other of the two chief European forms, *Mus musculus domesticus* and *Mus musculus musculus*. The forms found in North America are *Mus musculus brevirostris* and *Mus musculus musculus*. The former, a southern type, is the only representative of the species in Central and South America. The latter is the ordinary northern form. It reappears in Australia and Tasmania but is replaced by still another form in the temperate portion of South Africa. It is an interesting speculation whether the distribution of these 11 forms would shed light jointly upon the travels of man and upon the relative times of introduction of the different forms into regions outside the old homeland of the species, which is probably South Central Asia.

The house mouse differs from the rats in one very useful characteristic: It likes somewhat sweet materials and is, therefore, comparatively easily baited with grains and with peanut butter. Also, it is not very intelligent and not at all trap shy. House mice are often trapped in agricultural areas, along with native American mice, but the house mouse normally is a house dweller. In the northern United States, at any event, the control of the house mouse is considered a relatively simple matter in comparison with the control of rats.

Many estimates have been made of the damage done in the United States each year by domestic rodents, but they are only estimates. I think it may be agreed that the figure in any event runs into hundreds of millions of dollars. Estimates of the number of rats in the United States have also been attempted. Personally, I should not want to set the figure at less than twice the total population of human beings, but a census even in a very limited area is extremely difficult. It has been stated, for example, that in surveying for rats one may assume that the total rat population is never less than twice the largest number of rats that can be seen, and in many locations it has been proved to be far greater. For instance, a farmer may see two or three rats around a chicken house, but if, under appropriate safeguards, he tips the chicken house over, he can expect to get from six to ten rats.

In the literature are many statements of the fecundity of the rat. Within limits they are true — that is, that a grown pair can produce some six or more broods of young a year with as many as 10 or 12 in a brood. If one works this out, one gets staggering totals. The difficulty with such amusing calculations is that they fail to take into consideration various factors: in the first place, mortality before maturity, which we may estimate to be at least 50 per cent; second, the almost certainty that the number of broods is nothing like maximum, perhaps no more than two or three a year; and third, the fact that prenatal mortality is probably greater in the wild state than in the laboratory. I therefore submit my own estimate that the increase of a pair of rats under natural conditions will amount to something like 36 a year; in all conscience this is bad enough.

Domestic rodents are also associated with the carriage of a number of important diseases. Of these, the most famous is plague, which attacks rodents and is carried by rodent fleas from one animal to another or to man. The Review for January contained a brief discussion of plague in the United States.

Although plague is very widely distributed, it is relatively rare in man and rodents outside of eastern Asia. It is by no means certain how far the plague had traveled before the advent of modern commerce. Great epidemics of it reached Europe in the Middle Ages; whether they went also to the southeast is uncertain. At least one author claims that New Caledonia is an ancient focus, but certainly there is no other in the Pacific islands.

A number of other diseases of importance are carried by domestic rodents, and some of these are described briefly below. Weil's disease, or infectious jaundice, is marked by a disabling fever often accompanied by jaundice and numerous small hemorrhages of the skin and internal organs. Although we have not very often heard of Weil's disease except during World War I when it harried the trenches, it is probably widespread — especially in the Northern Hemisphere — though often it may not be recognized as such. The causative organism rejoices in the jawbreaking name of *Leptospira icterohaemorrhagiae*. It is about 4/1,000 inch long, and the body is a coil of about 16 rather close turns. In nature, this seems to be a disease of rats and has been most frequently noticed in persons who come in contact with rats or places inhabited by them — for example, slaughterhouse workers, coal miners, sewer workers, and quarrymen. No vector is known, and it is still uncertain how the spirochete gets from rat to man. It is especially likely to be found in the urine of diseased animals.

A disease resembling Weil's disease in some ways is ratbite fever, or sodoku. It too is transmitted directly from rats without a vector and it is largely restricted to the Northern Hemisphere, but in other respects it exhibits striking differences from Weil's disease. The disease begins with an ulcer at a spot bitten by a rat. This is followed by a fever of the relapsing type and sometimes by a spotty, reddish rash. The causative organism is variously held to be a peculiar spirochete or a bacterium, and it goes by several names, such as *Spirochaete morsus muris* and *Spirillum minus*. It is not out of the question that two different organisms causing similar disease are involved.

Although John Citizen is more apt to associate rats with plague and infectious jaundice, we should really stir him up about food poisoning. He may be in the trenches once in his life, if at all, and probably will never visit a plague-ridden country. On the other hand, he eats food every day and often knows little of the conditions under which it is produced. Food poisoning is a term covering a multitude of sins but is properly applied to acute disease due to infection with one or more kinds of bacteria included in the genus *Salmonella*, which is the real villainess among the

bacteria associated with rats. Nearly 40 species of these bacteria are known, causing various diseases in various animals. Certain species cause paratyphoid and food poisoning in man.

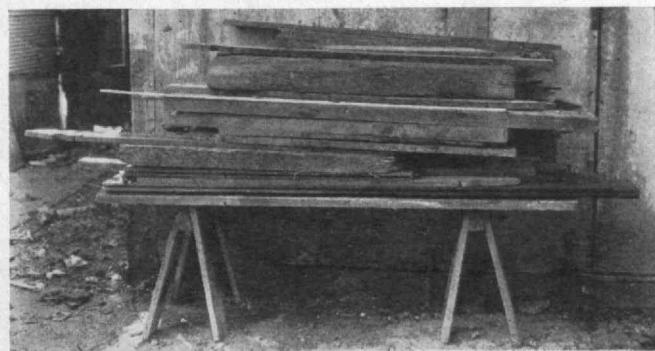
The normal process of transmission is for food or drink to be contaminated by bacteria from an already infected individual, either man or rodent. This food, eaten by a susceptible animal, will normally cause a new case. The English authority on food poisoning, Sir William Savage, stressed the role of rodents in contamination of food. His contention was based to a great extent on the frequency with which mouse feces were found associated with food products, not on a direct tracing of bacteria to mice or rats. I suggest that the most important sorts of conveying foods are those made commercially, not tightly wrapped immediately after cooking, and eaten without further cooking. This accounts for the prevalence of food poisoning from cream puffs and similar pastry products. Henry Welch, M. Ostrolenk, and M. T. Bartram in 1941 made the cautious statement that "since some few rats or mice may be infected with food poisoning organisms, they all must be considered potentially dangerous to health, and every effort should be made to eliminate them from establishments where human food is prepared or stored." The lesser frequency of such infection in the United States as compared to England is due in part to our much greater use of refrigerators for food storage.

Rats and mice serve as reservoirs of food-poisoning bacteria. Mechanical spreading of the bacteria could probably be accomplished by food-infesting insects.

The relatively mild disease called endemic or murine typhus is largely confined to the South Atlantic and Gulf states. To it may be assigned most of the nearly 1,900 cases reported as typhus in the United States in 1940. Not only the domestic rat but also various wild rodents are found infected. In the wild rodent, the disease is comparatively mild — a fortunate fact, since animals suffering from a mild disease or a slow-acting poison usually crawl into their holes to die, and the fleas infesting them are thus informally buried instead of being set adrift where they would be picked up by people. Plague, on the contrary, most often means sudden death to the rat and therefore liberation of its fleas where they may readily infect man. Workers of the United States Public Health Service and others have stressed the tendency of this disease to be concentrated in urban areas, which fact points to the assumption by domestic rats and mice of a dominant role as reservoirs. The vectors are various fleas and the tropical rat mite, *Liponyssus bacoti*. (Continued on page 560)



Essential to control of the rat is the elimination of "rat harbors." A simple example is shown here. At the left, lumber and odds and ends, loosely piled, make a perfect hideout for Rattus. At the right, piling the lumber high off the ground is a proper start toward elimination of the harbor.



United States Fish and Wildlife Service

The Oil Situation

The Demands of War Place Greater Emphasis on Augmenting the Supply of Petroleum

BY ROLAND F. BEERS

EVERY day the past 12 months the civilian and military demands of the United States required the production of more than 4,000,000 barrels of petroleum. Last year's consumption totaled more than 1,500,000,000 barrels, 8 per cent more than in 1942. At the end of the year, average daily production was a half million barrels more than that of a year ago, an increase of over 14 per cent.

To find the real significance of these figures challenges one's imagination. Five-gallon cans of gasoline stacked on end until they reach the moon do not mean much, but examples of the use of petroleum as fuel by our armed forces do. Of the great tonnage of military personnel and equipment transported overseas, 65 per cent of all shipping is allotted to petroleum products. Six hundred thousand barrels of gasoline — one-third of our total production — are being taken by the military every day. This would be equivalent to 5,000,000 B coupons. Our armed forces require approximately 50,000,000 gallons of gasoline, fuel oil, lubricants, and other products of petroleum *every day*. In 1942, our Navy consumed over 1,000,000,000 gallons of oil; in 1943, it required twice that amount; and during the present year, it will use a great deal more.

A thousand planes making an attack on central Germany consume more than 1,000,000 gallons of gasoline and 30,000 gallons of lubricating oil, enough to supply over 10,000 A-card holders for a full year. One mechanized Army division with a total horsepower of nearly 200,000 will burn 18,000 gallons of gasoline each hour it is on the move. Every Flying Fortress starts out with not less than 500 gallons of gasoline in its tanks. The Navy's new fighting Hellcat burns as much gasoline in one hour as it would take to drive a car from Boston to Dallas, Texas.

Civilian consumption of gasoline was reduced by the Petroleum Administration for War to 1,117,000 barrels a day in the first quarter of 1944, a decline of 38 per cent from normal peacetime civilian requirements. The gasoline supply for the civilian motorist in 1944 will not increase, according to present estimates of military demand. It may actually decline. Consider the fact that three pounds of gasoline are needed to deliver one pound of bombs filled with petroleum explosives and the fact that to date we have produced more than 1,600,000 tons of aerial bombs. With an all-out invasion of Europe in progress and a full-scale offensive in the Pacific likely in 1944, it is easy to foresee what will be required in petroleum and its products.

Our ability to produce enough oil to meet all requirements may be estimated from a glance at the nation's reserves: In storage above the ground in January, 1941, we had approximately 263,000,000 barrels of crude oil. By January, 1944, these stocks had declined to 249,000,000 barrels. The corresponding figures for heavy fuel oil stocks are 86,000,000 barrels in January, 1941, and 54,000,000 barrels in January, 1944. Gasoline stocks of 90,000,000 barrels in January, 1941, fell to 78,000,000 barrels in January, 1944. Light fuel oil stocks showed a slight gain: 37,000,000 barrels in 1941 as against 39,000,000 barrels in 1944. Expressed in the number of days' supply on hand, we had in January, 1941, 72 days' supply of crude oil, 104 days' of heavy fuel oils, and 50 days' of gasoline. By 1944, these figures had shrunk to 58 days' supply of crude, 42 of heavy fuel oils, and 40 of gasoline.

If existing reserves cannot be produced in sufficient quantity to meet current demands, what of the coming year, and the next? Some operators foresee a daily demand of 5,000,000 barrels in 1945. At present we are having difficulty in producing 4,500,000 barrels a day, and the most optimistic outlook for this year does not exceed that figure. A daily deficit of 500,000 barrels of petroleum is no trifle. Where will it come from?

There are two possible sources of additional oil: One is foreign fields, the second is new discoveries in the United States. Foreign oil can easily fill the immediate demand. Some of it must be imported to the United States and processed here. Inadequate refining facilities now exist abroad, particularly for special products such as high-octane gasoline and butadiene. If there is a deficit of 225,000,000 barrels in United States production in 1944, the Petroleum Administra-



Pure Oil Company
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Photographs by R. I. Nesmith suggest the trials of petroleum hunters. Here a seismograph party sleds its boat along a bayou in Louisiana swamps. Head nets protect the men against malarial mosquitoes.



Pure Oil Company

The party's surveyor takes an alidade reading.

tion for War will probably supplement United States production with this amount of foreign oil. About 70,000,000 barrels will be received from South America for United States refineries. A total of 140,000,000 barrels will be produced and refined abroad. The remainder of 15,000,000 barrels may be taken from United States stocks.

Whether or not these plans will meet all requirements depends upon our ability to produce this quantity of foreign oil, process it, and deliver it to our fighting fronts. Many hazards lie ahead in 1944 and 1945. To assure a foreign oil supply, American drilling crews and equipment must be sent to South America and other producing areas. United States producers will not willingly part with their already depleted supply of skilled oil-field workers and equipment. Although 150 new power rigs will be acquired by the industry in 1944, serious bottlenecks will remain in critical components later this year. Further hazards confronting the program are the submarine menace to tankers which must supply the European invasion and the difficulty in maintaining the present high level of domestic production under difficult conditions. Maintaining domestic production (and increasing it if possible) is extremely urgent.

It is generally agreed throughout the industry that we can produce 1,600,000,000 barrels of oil in 1944 provided certain difficulties now in the way are removed. One of the issues to which the industry and the press have recently given much attention is the price of crude oil. The average price of crude as determined by the Office of Price Administration in November, 1941, is \$1.18 a barrel. This figure represents a range from 65 cents to \$3.00, depending upon the quality of the crude. Producers have asked for an initial increase of 35 cents a barrel. Admittedly this is only the beginning of an upward price adjustment. There are many separate effects which such an increase might produce.

Independent producers, and particularly operators of stripper wells, contend that their reserves are being depleted at less than replacement cost and that present prices compel a shutdown of small wells which might be

continued in production by secondary recovery methods if a sufficient return on the expense were available. Three-quarters of the 410,000 producing wells in the United States are strippers, accounting for 15 per cent of the total daily production. These small wells may produce five barrels of oil a day or less, and if their abandonment during 1944 could be retarded in any way, 2,000,000 barrels of oil would be added to the year's supplies. While this is only 1-per cent of the coming year's deficit, it may prove to be worth while.

Although an increase in the price of crude may not be justifiable on strictly economic considerations, the effect of an increase would be of unquestionable value. In the past, price increases have always resulted in the discovery of new reserves. The relationship is complicated, and usually there is a delay of from one to two years after price increases before new reserves are proved. At least one student of this problem predicts that the requested price increase of 35 cents a barrel will not result in the discovery of enough petroleum to meet 1945 demands.

A 35-cent rise would cost the country about half a billion dollars at the well, increase the consumer price of gasoline about one cent a gallon, and double the gross profits of many oil companies, according to Fred M. Vinson and the Office of Price Administration. He suggests, therefore, that operators of stripper wells be subsidized; but any such idea is repulsive to the independent oilman, who will neither ask nor take favors from anyone. If the price of crude were increased from 50 cents to \$1.00 a barrel, it might be possible to produce an additional three to five billion barrels of oil from these stripper wells at the rate of 18,000,000 barrels a year. The O.P.A. argues that government subsidies would encourage secondary recovery projects, such as repressuring or water flooding under high pressure through key wells. In Pennsylvania these methods have been used for more than 20 years in the Bradford field, where water flooding has produced about 200,000,000 barrels of oil otherwise unrecoverable.



Pure Oil Company

The drilling crew is jetting a shot hole in the bayou bottom for the location of an explosive charge.



Pure Oil Company

The seismograph recording crew with their instruments at work in flat-bottomed bayou skiffs

All this money would probably produce more oil at an earlier date if it could be spent in the drilling of new wells. Many oil producers contend that as much oil could be taken from wells spaced one to every 10 acres as by closer spacing. Recent drilling regulations of the Petroleum Administration for War have required wells no closer than one to every 40 acres. In recent months, however, experiments have shown that closer spacing of wells will result in increased immediate recovery. Additional new wells in between old producers might thus lead the way to a rapid increase in daily production.

The Petroleum Administration for War has requested the industry to drill 19,000 of these development wells in 1944. We shall be lucky if this number can be drilled. There is now a net shortage of 10,000 drilling workers who have left the oil fields for other war industries. Many have gone into military service. Increasing allotments of steel will provide for the rehabilitation of existing drilling rigs, but the operation of this specialized equipment by inexperienced crews will result in many breakdowns and a lowered drilling production.

In addition to purely development wells, the Petroleum Administration for War wants the industry to drill 5,000 wildcats this year. If the stakes appear high enough to men of courage in wildcatting, then certainly some activity will follow a substantial price increase. This is the factor in oil production that defies economic laws and formulas. For some reason or other, whenever the game gets hot enough, a handful of characters of Paul Bunyan dimensions appears in the hunt. These boys are the ones who have discovered some of the largest fields in the United States. There is no accounting for their behavior, and it may be that we pay special attention to them solely because of their gigantic prowess. For every one who discovers an East Texas, hundreds lose their shirts and are never heard of. Nevertheless, they constitute an important economic factor in the discovery of new oil.

With the support which the major companies lend, these wildcatters drill holes in places where no scientific justification therefor can be discerned. Even though such a hole produces no oil, it contributes to the general

geologic knowledge of all potentially producing provinces and narrows the hunt to the ultimate areas of production. Much exploration goes on in secluded offices of oil companies under the eyes of men who do little else than study the rock cuttings of dry holes. Through examination of the rock samples brought up by the drill and correlation of them with other wells in the area, the subsurface geology of each province is gradually unraveled. Long ago geologists learned to look for oil on structures which were apparent at the surface. Today most of these promising prospects have been drilled. The search must now be made with more precision and finer tools. Save for the rapidly developing Rocky Mountain area, we cannot expect that many oil fields will be found from their surface expression.

That the wildcatters have discovered a great many very large fields does not necessarily mean that they have found most of the oil in the United States. Beginning about 1920, scientific methods were employed in the search for oil; they

have gradually developed until they have practically taken over the job of providing new reserves. The techniques are now so complicated that petroleum geologists no longer assume full responsibility for the task, and the array of scientific talents assembled for this work is impressive. Physicists, chemists, electrical engineers, mathematicians, bacteriologists, biologists, paleontologists, mineralogists, petrographers are some of the specialists who devote full time to the problems of finding oil. Field crews may be composed of any of these men plus a greater number of mechanical and civil engineers, surveyors, drillers, dynamite shooters, truck drivers, pumbers, and helpers of all kinds. Three hundred and fifty of these crews, numbering up to 15 men per crew, are now at work throughout continental United States in search of oil. The total annual outlay for exploration now exceeds \$350,000,000. With the discovery of 1,500,000,000 barrels of oil a year for the past few years, this means that it costs roughly 25 cents to find a barrel of oil. In 1943 this cost was increased, as the amount of new oil found that year declined to just slightly more than 1,000,000,000 barrels.

This decline in new discoveries has been going on now for several years. It is a matter of great concern to the industry at large and particularly to the small group of men who are charged with the responsibility of finding new oil. Because of the reluctance of wildcatters to carry on their exploration activities at the current price of crude, the emphasis on exploration has been shifted to the major oil companies, who are now operating their exploration crews at an all-time high. The result of this intense activity is an actual increase in the number of new fields discovered each year. In 1936, a total of 162 new fields were found; in 1943 the number was 348. The total reserves of the 1936 discoveries amounted to 2,400,000,000 barrels, while those of 1943 were only a quarter billion barrels. The reason for this decline in the volume of new discoveries is shown from the average size of field discovered. In 1939 this amounted to 5,600,000 barrels; in 1942 it was 1,200,000 barrels. Undoubtedly more new oil could be found by all scientific methods if the rewards of discovery could be increased. Many areas are not being explored because the cost of exploration is greater than present returns would warrant. (*Continued on page 566*)

The Teacher's Task

Not Training, but Education toward Attainment of Spiritual Freedom, Is the Primary Goal of the School

BY B. EDWIN HUTCHINSON

Recently in Detroit the National Association of Manufacturers and the National Education Association joined in sponsoring a Conference between Industry and Education for discussion of problems and projects of mutual interest. This essay is drawn from an address Mr. Hutchinson delivered at the conference.—ED.

IT is rather the fashion of late to play down individuality and refer to people by classes. We hear a lot about the industrial interests, the farm bloc, labor, the youth movement, parents' associations, the teaching profession, Wall Street, what the East thinks, what the southern point of view is, and so on — until one begins to wonder just what area of thought, action, or interest may be left for you and me as just plain folks. As a matter of fact, this very gathering has more than something of a collectivistic approach in that it is avowedly an organized effort to bring about a better understanding between educators and business people as classifications of citizens.

In a way, the necessity for such a meeting as this is unfortunate. In the simpler days of our forefathers, when communities were smaller, we should all have known one another as a matter of course. Knowing each other on a more or less intimate social and personal basis, we should have found that most of the problems now said to exist between teachers and business people, as classes or groups in our social order, either never arose or were readily worked out. As it is, I am not exactly certain what these problems are, much less what the answers may be. Under these conditions, it seems high time we did get together and find out what it is all about.

The primary purpose of this meeting, as I understand it, is that we get to know each other as individuals, and with this end in view, we are shortly to break up into small groups where we shall have an opportunity to talk back instead of just being talked at. I am looking forward to this experience, because in my recollection this is the first time I have ever been encouraged to "talk back" to a schoolteacher!

I must say, however, that I approach this experience with all and more of that attitude of respect with which I approached my teachers as a child, but for quite a different reason. I have come to regard teaching as the most fundamental and essential activity in life. Without it, no phase of what we cherish as our civilization could be perpetuated beyond the present generation. Of course in a sense, we are all teachers, just as we are all students, or should be if we expect to continue to grow and expand. To you who have elected to adopt teaching as a life's work, however, it must be a particularly soul-satisfying experience to realize that you are entrusted with the prime responsibility for inculcating into the minds of the young those ideas, those attitudes and values, which are at once our heritage of the past and the foundation for the future.

Right here might be a good place to divest myself of the principal observation on education which I shall make in the course of this talk, and at that it can be only a suggestion: It seems to me our modern educational approach does not sufficiently differentiate between "training" and what I choose to call "education." It tends to put undue emphasis upon training to the neglect of real education.

The end objective of education is the making of men and women, in the highest sense of those words. Education is the inspiration and guidance of childhood through youth to a rounded maturity of adulthood. For education to be truly successful, its end product must be men and women who have developed character at the same time that they have acquired knowledge. We can train animals, but the education of a man is a human awakening. The prime goal of education should be the eventual attainment by each individual of an inner spiritual freedom, the liberation of the individual from the bonds of ignorance and prejudice through the acquisition of knowledge and wisdom. Specific training in the arts and trades helps the individual to lead a normal, useful, and co-operative life in the community, but this, it seems to me, is not the primary — it is a secondary aim of education. When the primary emphasis of educational activity is diverted to such avowedly utilitarian ends as mere training, it can, and on occasion does, degenerate into such evil manifestations as the nazi youth organizations and training schools, where all sense of truth in the human mind is smashed, all moral values are perverted, and the individual is relegated to the position of being merely a part of the technical equipment of the state.

The good society is that in which free men individually acknowledge their responsibility to conduct themselves under laws of their own devising in a manner which accords due respect to the rights and dignity of all others. It is the practical application in the political and economic fields of that moral principle so widely known and so little practised, the golden rule. Historically, this seems to have been most nearly, though as yet imperfectly, attained in democracies, and the best example of it so far is to be found in these our own United States.

The whole idea, however, is currently under challenge, and the greatest war in all history is now being fought on the issues it raises. If the outcome is not still in doubt, it nevertheless remains a fact that the world has had a pretty close squeak. Furthermore, there are plenty of differences of opinion right here among us in this country about how things ought to be run — enough to furnish material for several evenings' discussion.

Now it has been by no inadvertence but by cool design that I have led this discussion into deep and troubled waters. I have suggested questions of momentous import, and I have done so because these questions will have to

be dealt with by these same young people you are now engaged in educating. I am suggesting to you teachers that the real problem to be faced in your field is not how we can train more and better plumbers, doctors, mechanics, lawyers, engineers, and what not, but how we can rear successive generations of free men and women with the courage, the vision, and the wisdom to preserve, cultivate, and improve the finest heritage mankind has yet devised. Today this is a weary world and full of trouble. It is largely engaged at the moment in its own destruction. Much investigation is needed to learn how it got this way; what can be done to stop this mass suicide of the human race; how repetitions of this sort of thing can be avoided in the future; and, most urgently and particularly, what had best be done here and now in the interests of our own country.

These are the sorts of questions with which the boys and girls you are now teaching will have to deal successfully, much more successfully than our generation has been able to, if the way of life the advantages of which you and I have enjoyed is even to endure, to say nothing of the future realization of the dreams of the America that you and I have envisioned.

The laboratory, the manual training classes, the cooking schools, have their place in your educational paraphernalia as educational tools to impress the minds and imbue the souls of the young with the fact that this is a material world in which we live and that there are practical problems in it with which we must deal. All this is important, for some of the most troublesome people with whom the world has to contend are those impractical dreamers who attempt to cope with the problems of life as mere theoretical abstractions; yet the utilitarian aspect of the educational technique must be kept subordinate to what seems to me to be the ultimate fundamental objective of education — the making of men of character and good will.

Now I have practically used up my time talking on education. One is apt to talk most freely on subjects about which one knows the least. I am featured on this program as a representative of industry, and I find that I instinctively approach a discussion of that subject with much greater diffidence.

Let me say at the outset that I am well aware of some of the criticism that from time to time is leveled at industry by educators and by many others. Criticizing industry is one of the favorite national pastimes, widely practiced during the past 12 years particularly. I can't begin at this time and in these circumstances to respond to all the indictments drawn against business or to analyze all the doxies proposed for its regeneration. Our various political contenders may be confidently relied upon to do that for us, and with great sound and fury, if not intrusiveness.

Historically, the demagogue has for his own advantage always sought to tear down the existing order rather than to strive for its improvement, and there are those among us today who are eagerly resorting to this historic pattern. Their appeal is to ignorance, selfishness, and hatred, and the only effective counter to their disruptive influence is the cultivation of an intelligent love for truth and of an attitude of good will toward one another. Such an undertaking is the peculiar province of our teachers, secular and religious, and too little recognition has been accorded this fact by most businessmen, among others.

When we contemplate business activities and all other activities — social, educational, political, religious, or what have you — we must differentiate carefully between the functions served and the personal practices and propensities of those individuals serving them. There are just as many different kinds of businessmen as there are different kinds of teachers. There must be. We are all just ordinary human beings, grown up in the tradition of Americanism, the product of America's educational system. As such we are pretty good as mankind goes but still subject to improvement.

The function of business and industry, on the other hand, is quite impersonal and wholly objective. In ordinary peacetime, that function is the organized production and exchange of goods and services. It is an important segment of human activity, as are agriculture, education, politics, and soldiering. Relatively speaking, industry has increased in importance over the past century and a half as compared with agriculture because the mechanization of farm work has enabled us all to get enough to eat if one man out of five will work on the farm whilst formerly the task required four out of five. During the past two or three years, soldiering has become relatively more important than either agriculture or industry; so we are all getting along with fewer things.

We find we can change things around a good deal as the necessity arises, and we make up our minds to do so. Our factories are now making munitions of war and our schools are now largely devoted to the training of soldiers and sailors. The instrument by which these changes are accomplished is an institution called "government," which in time of war becomes even more than ordinarily important. The people who work at government are called "politicians" unless there get to be so many of them that they just have to mess into other people's business to find something to do, in which event they are called "bureaucrats"; or unless they become very good at their work, in which event they are called "statesmen," though that designation is seldom applied until after they are dead.

During this war emergency we have all cheerfully submitted to varying degrees of governmental regimentation and direction of our activities, industrial and educational, all for the purpose of promoting the war effort. There are those among us who feel that some fundamental change in the freedom which has characterized our way of life in the past is desirable. I for one, and most of us, I hope, are not sympathetic to permanent change in that direction. We prefer to work out our destiny on a more American basis.

We hear more or less about a "planned economy," but the question seems to be largely who will do the planning — the government bureaucrat or the people. American industry has been built with capital accumulated through the thrift of our people and expended by those with the vision to plan for the satisfaction of the people's needs and desires. The services of American business are assayed in the competitive markets by those same people, its customers. Do not overlook the fact that a government which plans what industry will produce also plans what the people will buy, and where people will work, and, if you please, what teachers will teach and how they may teach it! Industry is solidly against this idea, which the demagogue misrepresents as progress but which history discloses as reaction. The great- (*Concluded on page 574*)

Romance Along El Camino Real

BY NEILL JAMES

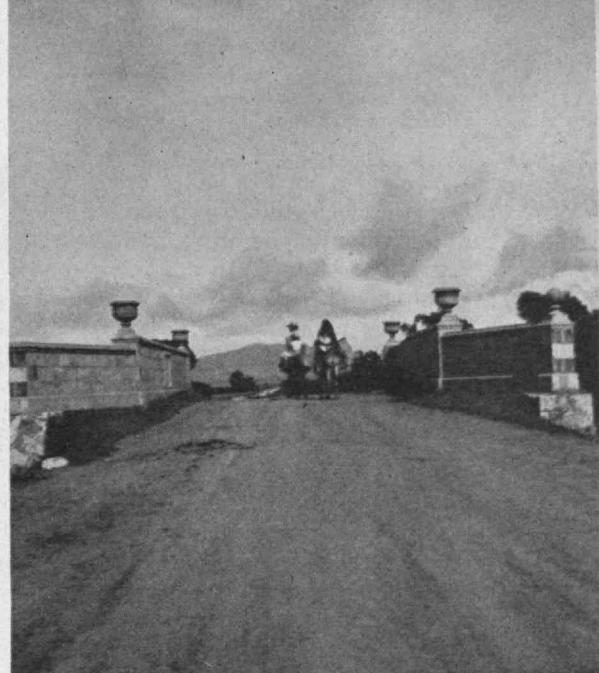
THE binding together of the peoples of the peace-loving Americas by a fragile ribbon of highway rather than by conquest of arms is a concept to stir the imagination of man. As the Pan American Highway nears completion, new riches of understanding and interest will be available to the varied peoples whose lands the road traverses.

The idea was not original. Centuries before Cortes and his Spanish conquistadors arrived in the Western Hemisphere in 1519, the Indians had already realized their primitive version of a Pan American Highway, a *camino real* (royal road). It was a dry-weather trail winding over mountain passes and penetrating tropical jungles, but it suited the needs of a prehorse age when man was his own burden bearer. Caravans of Zapotecan and Mixtecan Indian traders accompanied by their *cargadores* (bearers) traveled on foot through Central America all the way to Peru to barter wares with the Incas. Cortes found it expedient to control this trade route. To this end he conquered and fortified Oaxaca, seat of the Zapotecan civilization. He enforced the Spanish custom of discouraging communication between villages, to keep unwilling subjects disunited. The effects of this act have not been eradicated even in our own times. Today, only about 3 per cent of Mexican villages are connected by any sort of motor road.

The plan for a Pan American Highway drawn up a quarter century ago was grand but practical. As planned, the main route extends from Alaska in the North to Patagonia in the South and runs the gamut of latitude and altitude. Each of the republics to be traversed by this international highway agreed to construct a linking road from border to border. The distance between the official termini — Fairbanks in the North and Rio de Janeiro in the South, via Valparaiso and Buenos Aires — is just 15,494 miles, something more than halfway around the earth as the crow flies. It is the longest highway in the world.

By 1930 work was under way, proceeding in a normal, leisurely fashion. Although the benefits to the American republics were to be incalculable, there was little haste in opening this wonderland to travelers. War shocked the Americas into the realization that the Pan American Highway was their own unfinished Burma Road. There followed a spurt of effort to complete the highway. In the North, Army engineers and bulldozers crashing the underbrush from north and south met in the Yukon wilderness in November, 1942. Shortly thereafter Army supply trucks were rolling over 1,671 miles of pioneer road linking the United States, Canada, and our territory of Alaska. Today 95 per cent of the entire Inter-American Highway is in active use. The principal bottleneck is a 290-mile length in Ecuador, with a few difficult mountain stretches yet to be mastered in Nicaragua and Costa Rica and one in southern Mexico.

En route to Mitla on the Pan American Highway in the Mexican state of Oaxaca



In a mountainous country with abundant cheap labor, an unpaved highway is not the headache it would prove to be in our own country. In Guatemala, where the entire 300-mile length of road is graveled, one million Indian citizens prefer to work for two weeks each year on national highways rather than pay the \$2.00 annual tax. I watched them deftly filling and tamping gravel in chuckholes with rude wooden mauls. They had no machinery, not even a lowly wheelbarrow. Hundreds of men clad in hand-woven costumes carried dirt and gravel in boxes upon their backs.

One must regret that even the most imaginative future traveler who has not been an eye witness to some of the work cannot conceive of the titanic task involved in the construction of this trade artery of the Americas. Engineers maneuvered impossible mountain grades, bridged roaring rivers, crossed dank tropical jungles. Much of this labor was without benefit of road-building machinery. The war, of course, delayed or cut off the flow of spare parts for the already inadequate machinery. An instance of the inventive genius in bridging such gaps in material is the job in Nicaragua, where engineers in search of a substitute material for clutch and brake linings found it in lignum vitae, the unusually hard, oily native wood which grows abundantly in Mexico and Central and South America.

As late as last summer the trip from Mexico City to Oaxaca could be made only over a narrow-gauge railway or by air. The gap in the highway between Tehuacán, where the pavement ends, and Tehuantepec was mostly in the blueprint stage. In company with two mining engineers, I traveled over a section of this projected road when it was in the roughest stage of construction, barely passable. We went to a point some 80 kilometers northwest of Oaxaca, where workers who live in adjacent districts received ₡1.50 a day¹ plus overtime which increased the average daily wage to about ₡3.00 (60 cents in United States money). This was considered "inflationary" by rival bidders for labor. Contractors fared better financially than workmen. One Oaxacan contractor made a profit of ₡80,000 on a four-kilometer length of road construction.

I watched a thousand white-clad Indians literally carving the tops off green mountains, filling in steep valleys by hand. It was a dramatic sight. The single piece of

¹ In United States money, a peso is about 20½ cents; five centavos equal a cent. Hence, \$1.00 equals ₡4.85; ₡1.00 equals 100 centavos.

machinery on the job, a crane, bit out five tons of red earth and tossed it into the fill in less time than was required for an Indian to load a wheelbarrow. Promptly at two-o'clock lunch hour, work ceased. Little fires were lighted. The Indian worker made a frugal meal of toasted *tortillas* (paper-thin corncakes), coffee, and *frijoles* (beans) heated over the campfire. After a siesta, he returned to work drilling holes for dynamite or pushing a wheelbarrow.

The new Pan American Highway is the first road in history to link the fabulously rich city of Oaxaca in southern Mexico with the capital. Today the leisurely traveler along the Inter-American route may linger beneath the cooling shade of the ahuehuete in the plaza or wander through the streets of this colonial town and observe on every hand examples of exotic Zapotecan Indian culture through the faint veneer of customs brought from Spain four centuries ago. The persistent Indian assembles for a weekly market a block from the central plaza, on the spot used before the coming of the Spaniards. For 75 centavos the Indian traveler continues to find a night's lodging and food for himself and animal in a *burro posada* (donkey inn) in the heart of the city.

Oaxaca is surrounded by ruins revealing the splendor of ancient Indian civilizations. Within walking distance of the central plaza are the recently unearthed tombs on Monte Alban. The priceless jewels of the aborigine—necklaces of solid gold, combinations of gold, jade, pearls, and onyx, and other ornaments—together with a lapis lazuli inlaid skull of a Zapotecan potentate, may be seen in the Oaxaca Museum. And only 27 miles farther south along the new highway is the ancient ruined city of Mitla, containing the early Zapotecan tombs set among wild fig, flowering pomegranate, and fragrant lemon trees. From this historic spot the road will follow the ancient caravan route to Tehuantepec. Impassable during the rainy season, when even a horse sinks belly deep in mud, it is the only broken link in the Mexican section of the highway.

On the isthmus of Tehuantepec, the narrow land bridge which connects North and Central America, lives a race no passer-by will forget. Stately, beautiful Indian women, their glossy black hair braided with many hued woolen yarns and coiled about the head like a crown, full pleated ruffled skirts swishing about slim bare ankles,

Amazons all, they run the affairs of the villages and boss the local markets. During *fiestas* these beauties do not consider themselves properly attired without a full complement of long gold filigreed earrings and necklaces of solid gold ornamented with pendant \$20 gold coins. On the opposite shore of the isthmus dwell their less glamorous but more startlingly clad sisters, whose costume consists of a long full pleated skirt and *nada más* (nothing more).

Perhaps the most interesting race to the traveler concerned with the infinite capacity of man battling nature for survival will be encountered about halfway down through Mexico, in the Mezquital Valley. They are the Otomi, a people who live in a land without water. The paved highway extending south from Laredo, opened in 1936, passes within a kilometer of Ixmiquilpan, market center of the Indians living in this hinterland covered with cacti and mesquite, where the thirsty soil receives rain but twice or thrice a year. This tribe of men—squat of figure, strong of limb, their straight, tar-black hair contrasting with their traditional snowy-white cotton garments—are believed to have been masters of the central plateau of Mexico long before recorded history.

The Otomi lived in caves until the Seventh Century of the Christian era, when they emerged and built towns. Always poor and reckoned a backward tribe, the homely Otomi passed as dull boors among their neighbor countrymen, the handsome and powerful Aztecs. Modern intelligence tests have proved them as bright as the average, but they continue to retain their record as the poorest of all the inhabitants of Mexico. This tribe stubbornly resist attempts to resettle them elsewhere on more productive land, or to change or improve their traditional mode of life. Enslaved by the Spaniards, the Otomi has learned by centuries of experience that any change is usually to his disadvantage. He has reason to be suspicious of overtures. One investigator has estimated that an entire family subsists on seven centavos a day. Corn, the staff of life in Mexico, grows lush in the center of the valley of the Mezquital, which is blessed with irrigation. Ten feet on the upper, or dry, side of the last water ditch, only cactus grows. The line of demarcation is sharp and final. In the arid hills the modern Otomi dwells in a makeshift hut made principally of cactus leaves.

The Otomi are taciturn, dignified. No wide-eyed savages stared in wonder when I arrived on foot and begged

lodging in the settlement of El Nith. They received me as a social equal. One woman, Angelita (Little Angel), graciously offered me hospitality. Her home, made of cactus leaves, was a single, windowless room with earthen floor. Set among the cactus and mesquite in a small area on a hillside surrounded by a wall made of volcanic rock, it was typical of the dozen which composed the community. The atmosphere was smoky, the roof above black with greasy soot.

The common type of bed is a *petate* (woven mat) placed upon the earth, though some families do have raised



This typical Otomi Indian hut has a roof of maguey leaves. The trunks of growing organ cactus form its walls. Its owner, carding wool, earns his living by weaving serapes on a hand loom.

wooden sleeping platforms. The home where I stayed had one, and it was courteously given to me. Angelita, her mother, and her two young children took their *petates* and slept beneath a mesquite tree near the hut.

I shared with the family of four the simple evening meal prepared over a small campfire in a corner. This family, like its neighbors, subsists almost exclusively on a diet of corn and chili supplemented with tuna, watery fruit of the nopal cactus. Even the ubiquitous frijoles are a luxury. The local custom of eating but two meals a day springs from stark necessity. Seated in a circle about the campfire, we dined without table or cutlery. A rolled *tortilla* served as spoon.

An Otomi baby knows not the taste of orange or tomato juice, cow's milk, butter, meat, or cereal. He has never heard of spinach. Like his elders, he suffers the ravages of many preventable illnesses, such as malnutrition, malaria, amoebic dysentery, smallpox, and impetigo. Chief among his ills are stomach disorders resulting from the drinking of impure water. Entire families are also troubled with lice and fleas. Illnesses are treated with one or more of several dozen herbs, cures handed down for generations. In serious cases the witch doctor is called. A sickly child wears charms of red string or yarn about the wrist, neck, or ankle. Night air is considered dangerous. Witch doctors sell little round stones to be worn about the neck to ward off evil. These "wind stones" can be bought at the medicinal herb stall in the public market. Many of the herbs used in crude form by the Otomi, such as sarsaparilla, quinine, eucalyptus, cascara, and digitalis, have achieved a place in modern medicine.

Scarcity of water dominates life on the mesa, and a large part of Mexican labor is the carrying of water. In the dry area, an Indian will walk from two to ten kilometers to fetch a jar of water. By ordinary standards a large quantity of it is unfit for human consumption. Water shortages encourage the drinking of alcohol, more especially of pulque, an opaque drink of fermented *aguamiel* (honey water), extracted from the maguey (century plant). It is the national drink of Mexico and the only liquid to be had in Angelita's home where I visited. Even babies drink it.

I was filled with admiration for the manner in which the Otomi was able to make a go of it in a land without water where a miserly nature provides him with scarcely more than cactus and mesquite. From the several varieties of cactus he secures shelter, clothing, drink, and food. Each variety has its special use. The broad, tough, waterproof leaves of the maguey supply the principal building material for a home. The Otomi ties the framework together with fiber. Bent leaves hooked over parallel bamboo poles form a satisfactory "shingled" roof. When completed, such a house is valued at about \$8.00. Leaves cut from the same maguey and pounded produce a fiber for cloth. Each leaf is worth two centavos. A common sight is to see a woman with a hank of snowy maguey fiber draped around her neck, spinning it into thread by means of a pointed stick attached and twirled in her hand as she walks to the village or sits in the market place. (In Lapland, I saw women spinning wool in exactly the same manner.) When the maguey plant is old and about to blossom, its final service to the Indian is to provide him for a period of six months with pulque. He cuts the heart out, and a sap, or *aguamiel*, forms in the hollowed-out place. If pulque is needed, a young girl carrying an

The stately women of Tehuantepec, here shown in their characteristic costume, run the affairs of the town, even to bossing the local market.



earthenware jar and slender gourd wedges herself in between the stiff leaves, inserts one end of the gourd into the *aguamiel*, sucks it up into the gourd, and empties it into the jar. At home she pours the liquid into a gracefully shaped brick-red pottery jar containing a little leftover pulque, and within a few hours it ferments and is ready to drink.

Market day, the most important institution in a Mexican village, is a combination of business, pleasure, and religion. It is the choice day for the casual traveler to glimpse a cross section of Indian life. In time past, it occurred every fifth day, and all adult males were required by law to attend. It was then illegal for a man to dispose of his wares while en route. Today the custom persists. On a given day — Saturday in Ixmiquilpán — the plaza throngs with Indians selling, trading, buying. News and gossip are exchanged, social visits are made, religion is attended to. As an added fillip, a few of the men get tipsy.

The war has prevented the immediate surge of passenger traffic along the *camino real* up and down the Americas, but romance and adventure await the future traveler. He will see living cities, old before the discovery of America, lofty volcanoes capped with snow, pyramids larger and older than those of Egypt, and ancient battlefields. A branch highway leads to the world's newest and most violently active volcano — Parícutin. But of most interest will be the people themselves. The traveler will not only have the opportunity to make friends with or to be stared at by Eskimos of the Arctic, Patagonians of the antipodes, and nationals of the republics traversed by the highway in between, but he will learn to know the hundred or more diverse races, each with distinctive mode of dress, language, and customs, which compose the population of each of the republics.

THE INSTITUTE GAZETTE

PREPARED IN COLLABORATION WITH THE TECHNOLOGY NEWS SERVICE

Dean of Architecture

WILLIAM W. WURSTER, the distinguished California architect who has designed many notable buildings and large-scale housing projects, has been appointed dean of the Institute's School of Architecture. Mr. Wurster succeeds Dean Walter R. MacCornack, '03, who retired on July 1.

Dean Wurster's work stresses the importance of regionalism and indigenous design, and his solutions are characterized by originality and freedom from stylistic restrictions, either modern or traditional. One of his notable designs is the United States Housing Authority slum clearance project, Valencia Gardens, in San Francisco, which he designed in association with Harry A. Thomsen, Jr. He also designed the Yerba Buena Club on Treasure Island for the Golden Gate International Exposition in San Francisco in 1939. Another example of his work is Stern Hall, a dormitory for women students at the University of California, which was designed in association with Corbett and MacMurray of New York. His Valencia Gardens project and the Schuckl and Company office building, an outstanding example of a business building for a country town, have been chosen by the Museum of Modern Art as examples of significant American buildings of the past 10 years. Carquinez Heights at Vallejo, Calif., and the Parker Homes at Sacramento are war housing projects designed by Mr. Wurster. In association with Franklin and Kump, he participated in the design of Chabot Acres at Vallejo. His professional experience includes notable work on filtration plants, one of which was developed for the East Bay Water Company in California.

Mr. Wurster was born at Stockton, Calif., on October 20, 1895, and is the son of Frederick William and Maude Evelyn Wilson Wurster. He was educated in the public schools of Stockton, after which he entered the University of California and was graduated with honors in 1919. His boyhood interest in construction was fostered by his family, and even before he had entered college he spent his vacations working in the office of an architect. During his studies at the University of California, Mr. Wurster took a course in naval architecture and marine engineering, after which he made several voyages across the Pacific and became familiar with the Hawaiian Islands and the Philippine Islands. In 1920 Mr. Wurster joined the staff of the architectural firm of John Reid, Jr., which was then engaged on the design of a group of San Francisco school buildings. This experience was followed by two years in Sacramento working under the direction of the architect Charles Dean and the well-known sanitary engineer Charles Gilman Hyde, '96. Mr. Wurster's experience during this period included drawing, specification writing, and field inspection, which required close collaboration between architects and engineers. He was licensed to practice architecture in the state of California in 1922.

After these three years of varied experience, he traveled for a year in Europe, studying architecture in France,



Sturtevant

William Wilson Wurster

Italy, and Spain. He returned to New York to gain further experience with the architectural firm of Delano and Aldrich. During a year in the East he carried on intensive architectural studies of the principal Atlantic Coast cities.

Mr. Wurster went back to California in 1924 to undertake the development of the filtration plant for the East Bay Water Company. When this commission was completed in 1926, he opened his own architectural office in San Francisco. His work between 1926 and 1934 included several notable country houses and the development of the Pasatiempo Country Club near Santa Cruz. By this time his work was attracting wide attention, and he was awarded a number of prizes in the *House Beautiful* annual competitions and honorable mentions in the northern California exhibitions of the American Institute of Architects.

In 1937, Mr. Wurster went to Europe to study the modern English housing projects and the work of outstanding Scandinavian architects, including Alvar Aalto of Finland. He then went to Germany to study the Frankfurt housing projects. Upon his return from his European trip, Mr. Wurster married Catherine Bauer, who has done notable work in housing and is the author of *Modern Housing, A Citizen's Guide to Public Housing*, as well as many articles and pamphlets.

In 1943, after 20 years of practice which included 5,000 war houses, Mr. Wurster closed his architectural office to study war and postwar architectural problems. He has since done special research on urbanism and planning.

Harvard University invited him to carry on his research work as a fellow in the graduate school of design, and as part of this study he took a city planning course under Professor Frederick J. Adams of the Institute's School of Architecture. This work, combined with study at Harvard under John Gaus, Alvin Hansen, and Joseph Hudnut, dean of the faculty of design, completed the preliminary work necessary for his doctorate in regional planning. To broaden his experience further, Mr. Wurster served as co-ordinator of design in the architectural school at Yale University for one term.

Postwar Curriculum

CHANGES in the undergraduate curriculum of the Institute to meet the special requirements of education in science, engineering, and architecture after the war, were approved by the Faculty at its meeting on May 17. The new plan is the result of a study started last October by a Faculty committee appointed by President Compton to consider simplification of the curriculum.

The future of technical education in relation to significant advances in science during the war was considered by the committee in revising the curriculum. The new program, therefore, incorporates long-range educational policies in a flexible plan which is adaptable to the changing needs that study discerns as probable immediately following the war. Based on a two-term academic year, the new schedule is expected to meet the requirements of college men returning from war service to complete their interrupted education, as well as the needs of young men who went directly from high school into the armed services and wish to begin their college courses when they return. The most important feature of the revision is a co-ordinated four-year program in the humanities and social sciences which emphasizes the Institute's long established educational philosophy of instruction in the ethical and social implications of science and technology.

The new schedule provides for a standard curriculum for all first-year students. The second-year curriculum has been divided into two main subdivisions, science and engineering, with an opportunity for the student to begin elementary subjects in his chosen profession. The number of undergraduate subjects is reduced from 523 to 412 by the consolidation of subjects of nearly the same content and purpose, and the elimination of certain options. The variety of schedules offered in the upper years is also reduced. Under the new plan, Meteorology is established as a separate undergraduate Course leading to the degree of bachelor of science in meteorology.

The four-year program in the humanities and social sciences provides that in addition to customary courses in modern languages, students will take one full course of a nonprofessional character every year. The work of the first year will be devoted to English, with emphasis on written and oral expression. Special provisions are made for students who when they enter are ready for advanced work in English and for foreign students who require intensive instruction.

In the second year all students will be given an introductory course in modern history with special reference to the place of the United States in world affairs. On the basis of the preceding courses, especially history in the second year, the third year will be devoted to the social sciences generally, economics, and psychology. In the

second half of the third year, students will be permitted to choose from a limited number of options in the general field of the social sciences. In their senior year, students will be given an opportunity to choose one of four options, namely, the history of thought, music and the fine arts, Western World literature, or international relations. Each of these four courses will be closely co-ordinated with the objectives and purposes of those given in the preceding three years. All classes will be held in small sections, and constant emphasis will be given to improvement in both written and oral expression.

In its social outlook the four-year plan in the humanities is an expansion of courses that have long been part of the Institute's curriculum. Even as early as 1865 when the Institute opened its doors, President William Barton Rogers was a pioneer in his conviction that a sound scientific or technical education could not be complete without adequate time and attention to the humanities and the social sciences. This purpose has been constantly emphasized.

In recent years many students have taken elective courses in pure and applied psychology, philosophy, and international relations. Most of these courses have been given on the free elective system. Thus, in the typical pre-war year of 1939-1940, nearly 2,000 students were enrolled in 57 different subjects of a general and essentially nonvocational character offered for the purpose of giving them an opportunity to broaden their education by an introduction to fields of thought and interest outside their chosen professional work.

The Faculty committee which made the study resulting in the revision of the curriculum was composed of Earl B. Millard, chairman, Leicester F. Hamilton, '14, Joseph C. MacKinnon, '13, George W. Swett, '03, Arthur L. Townsend, '13, Carlton E. Tucker, '18, and Bertram E. Warren, '24.

Regular and Special

REPORTS — of officers, committees, and councils — as is customary, constituted the main business of the last meeting of the Alumni Council for the present academic year (the 239th) which was held on May 22 at the Smith House in Cambridge. In addition to the regular reports which were heard and accepted, a special report, that of the committee appointed by Francis J. Chesterman, '05, President of the Association, to recommend ways and means to improve the organization and operation of the Alumni Association, came up for action, was discussed, and was passed by a unanimous vote recording the Council as accepting the report and favoring the recommendations which it made.

The special committee, under the chairmanship of the late Lawrence Allen, '07, held in their report that "the Institute during the readjustment period from war to peace conditions and in the years to come will need all the help, both financial and otherwise, that its Alumni can give; and further, that Technology men of all ages will welcome increasing co-operation and assistance from the Institute and from each other." The Alumni Association, the committee asserted, is the logical agency to provide this assistance and co-operation. "To improve our present procedure and broaden our sphere of activities," the report declared, "a man of suitable qualifications should be engaged on a full-time basis to function as an assistant to the President of the Alumni Association."



M. I. T. Photo

Robert Hallowell Richards, '68, the Institute's oldest living Alumnus, in the garden of the house in Jamaica Plain where he has lived for 70 years. Professor Richards, now in his 100th year, was born in Gardiner, Maine, on August 26, 1844. When he retired in 1914 with the rank of professor emeritus, he had been head of the Department of Mining and Metallurgy for many years and a member of the Institute staff for 46 years.

This officer, in the opinion of the committee, "should have his headquarters in Cambridge; should be an alumnus of Technology; should be of sufficient maturity and accomplishment to command the respect of all age groups who should be interested in the future of the Institute, including potential students of Technology, undergraduate and graduate students, Alumni and Alumnae, and leaders of industry; should be acceptable to the Institute administration and capable of rendering them service; if possible should have had an intimate association with the Institute administration and staff, so that he thoroughly understands the organization, the operation, the aims, the history, and the traditions of Technology."

"We believe," the report continued, "that the benefits accruing to Technology, to the organized alumni activities, to the individual Alumni and Alumnae, and to the undergraduate and graduate students, justify joint participation in the expense of the office by the Alumni Association and the Institute.

"Your committee unanimously and enthusiastically visualizes great benefits to Technology as a whole in the proposed plan but intentionally does not recommend in this report the specific duties of such an office, believing that such duties can best be determined gradually and in consultation with the Council, Alumni Association officers, and the Institute administration.

"We recommend adoption of the program as outlined and that steps be taken to put this program into effect."

Rowland S. Bevans, a graduate of the Carnegie Institute of Technology, now doing advanced study at the Institute, was introduced as the fourth in the season's list of speakers on student activities. Surveying life in the Graduate School, Mr. Bevans presented an interesting

picture of how research goes on and how war needs have led to unforeseen research opportunities.

Henry B. Kane, '24, Director of the Alumni Fund, whose distinguished work as a photographer and interpreter of nature is well known to Review readers, was the speaker of the evening. Showing a large and representative group of pictures made in his studies of birds, beasts, and bugs, Mr. Kane combined comment and narrative in a witty and compelling fashion. His presentation was received with hearty applause.

Appointment

PROFESSOR JOHN B. WILBUR, '26, has been appointed acting head of the Department of Civil and Sanitary Engineering, succeeding Theodore B. Parker, '11, who died in April.

Professor Wilbur is a native of Oakland, Maine, and was educated at the Academy High School in Erie, Pa., and at the Institute, from which he was graduated in 1926. He was awarded the degree of master of science in 1928 and his doctorate in 1933. He served as an assistant in his Department from 1926 to 1928, when he joined the engineering staff of the Maine Central Railroad. From 1929 to 1930 he was a bridge designer and detailer for the New York Central Railroad. In 1930 Professor Wilbur returned to the Institute as an instructor in civil engineering and was promoted to the rank of assistant professor in 1934. He was named an associate professor in 1937, and was appointed professor of structural engineering in 1943.

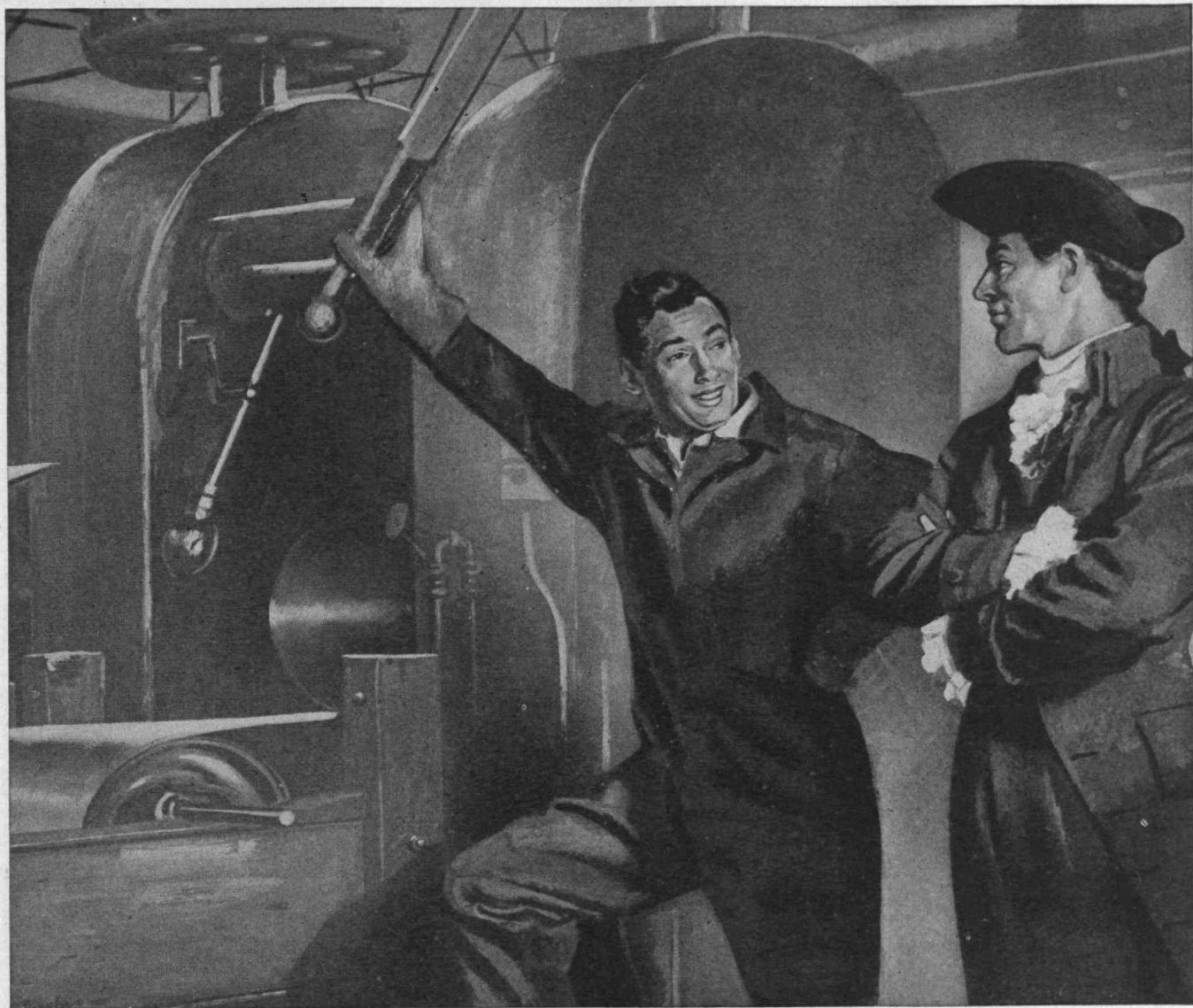
Professor Wilbur was associated with the firm of Fay, Spofford and Thorndike on the design of the Lake Champlain Bridge, as well as the continuous truss highway bridges over the Cape Cod Canal at Bourne and Sagamore. He has also done important consulting work for various engineering and insurance companies. Since 1940 he has been chief engineer for the Smith-Putnam wind turbine project in Vermont for the S. Morgan Smith Company. Professor Wilbur was responsible for the development of the Structural Analysis Laboratory which was established at the Institute in 1936, and in 1934-1935 he developed and built the simultaneous calculator, a computing machine which solves nine linear simultaneous equations.

Professor Wilbur, an associate member of the American Society of Civil Engineers and a member of the Boston Society of Civil Engineers, has twice received the designers' section award of the latter society. In 1943 the society presented him with the Desmond Fitzgerald Award. He is also a member of the Society for the Promotion of Engineering Education and of Sigma Xi, and an honorary member of Chi Epsilon, the honorary civil engineering fraternity.

He is the author, with Professor Walter M. Fife, '21, of a textbook, *Theory of Statically Indeterminate Structures*, and of many technical papers and bulletins.

Recognition for Service

WARD of a Certificate of Service was made to President Compton by the Army Air Forces Training Command at graduation exercises on June 5 for the more than 200 cadets of the Army Air Forces who had completed an intensive eight months' (Continued on page 574)



You'd be proud of our work. Paul Revere!

It is some sort of understatement to say that Paul Revere would be quite surprised if he were to walk through one of the plants that carries on the business he founded.

But, on the other hand, it is very likely that he would grasp clearly the purpose and workings of the great, complicated, marvelous tools he would find, and whose functioning is a ceaselessly repeated industrial miracle. For Paul Revere acquired the "know-how" of production the hard way. Through seven years of tough apprenticeship, he learned that working with metals is not just a matter of book knowledge, but of "feel" and experience.

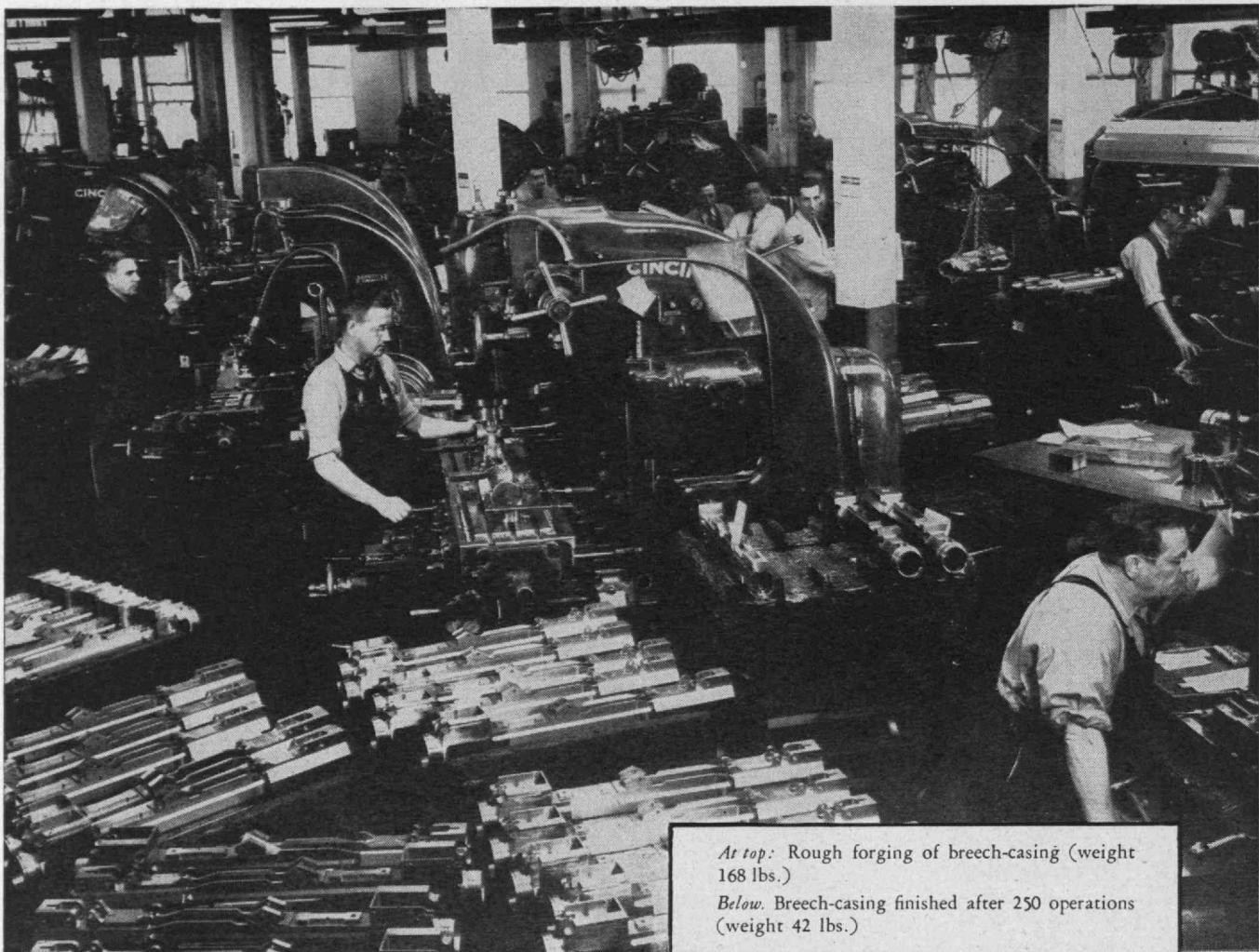
A diligent worker and a skilled craftsman himself, Paul Revere knew the worth of *manpower*. In his rolling mill he sought to employ only the best men he could find, and set a tradition for excellence of pro-

duction which has been preserved steadfastly. Today, standing behind every Revere metal, are thousands upon thousands of trained men. Even in these times, when so many of us must leave our jobs to obey the call of our country, every fifth man has been working at Revere for more than fifteen years.

This combination of experience in management and in men has enabled us to meet the exacting demands of war production worthily. In the course of this war work, we've added greatly to our knowledge. We've learned to work with steel, with aluminum, with magnesium. We've developed new alloys of copper and copper-base products. As a result, just as war found us ready to help meet the nation's needs, so we are now prepared to help fill the changed requirements of a revitalized American industry in brighter days to come.

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At top: Rough forging of breech-casing (weight 168 lbs.)

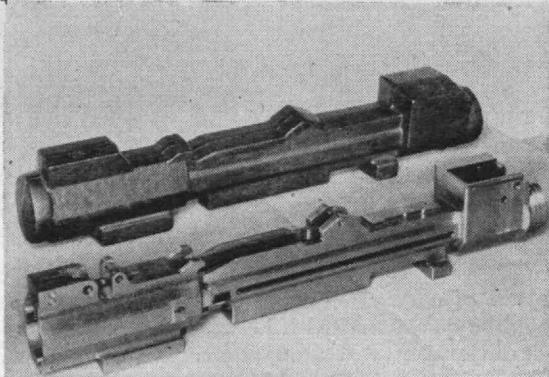
Below: Breech-casing finished after 250 operations (weight 42 lbs.)

**How
Taft-Peirce Contract Service
Tackled Many Jobs in One...
to turn blue-prints into breech-casings**



Late in 1940 Taft-Peirce Contract Service Engineers were asked how soon they could produce breech-casings for the now famous Oerlikon 20 mm. anti-aircraft gun. At that time the gun existed in the U. S. only on paper.

This complete breech-casing has been characterized as the toughest machining job in the whole war effort. Despite this, T-P engineers set to work to procure equipment, recruit men, design and build tools, jigs, fixtures, and gages to manufacture this "heart of the gun" which required over 250 operations on a single forging. All of this was



accomplished ahead of schedule; and less than 6 months after prints were received, the first breech-casing came off the production line, followed by an endless stream of these vital parts.

What manner of men and machines there are here, to handle assignments like this, you will plainly see in less than 20 minutes spent with the interesting illustrated book entitled: "Take It To Taft-Peirce". Write on your letterhead for a copy, to The Taft-Peirce Mfg. Co., Woonsocket, R. I.

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GENERAL RATTUS

(Continued from page 545)

For the next rodent-borne disease the best known name is Japanese river fever. What seems to be the same disease is also called tsutsugamushi, flood fever, scrub typhus, and Mossman fever. It is found along the eastern fringe of Asia from Japan and Malaya into the Dutch Indies and also in northern Australia. The causative organism, a Rickettsia, is harbored by mice and passed from one animal to another by mites, which are rather like the chiggers or red bugs of our southern states.

Obviously a serious rat problem exists. What can be done about it?

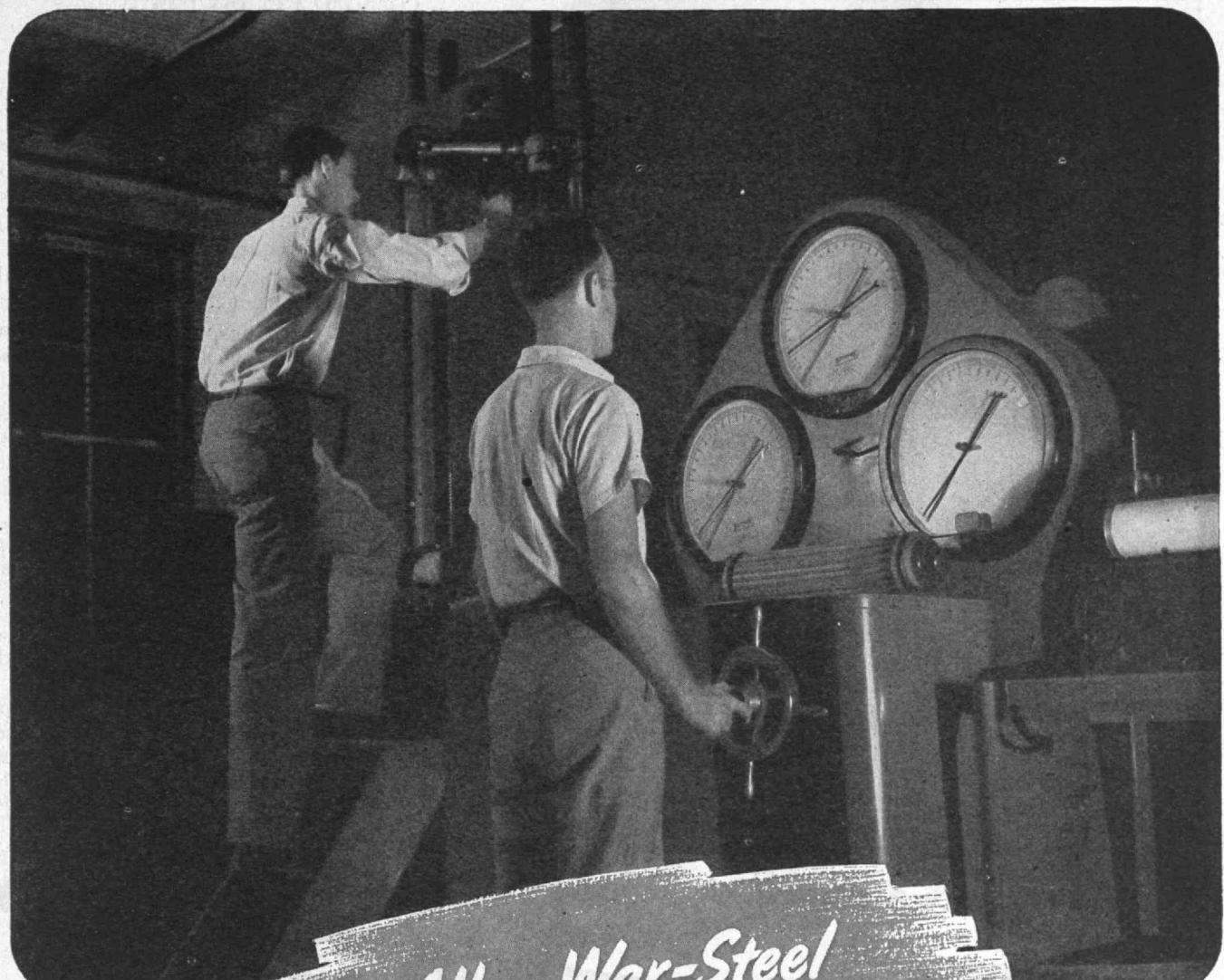
From the point of view of a biologist, the important thing is to deny food and shelter to the animals and let nature take its course. This is not a simple solution. It means essentially that buildings must be so constructed that rats cannot gain access to them and that food must be so stored that rats cannot break in. Notice that I have said nothing about killing rats; we should likely not have occasion to kill one if we did not provide them with food and shelter.

In the past, however, the emphasis on killing rats has been great. It has led in cities to the malodorous rat campaign — that is, to the theory that to keep the problem under control it is only necessary to slaughter rats intensively at intervals without undertaking other measures.

Such campaigns have not worked for two very good reasons: First, it was never possible to kill all the rats and to prevent all immigration; hence as long as rats had access to food and shelter, they were able in the periods between campaigns to rebuild their forces. Second, rat campaigns unfortunately had a political tinge which, of course, led in the first place to the doing of the easy or relatively cheap thing of killing the visible rats without making the long-range repairs which would have effected some measure of permanent control and which would have also cost individual property holders money. Of course, the killing of rats cost money too, but it was not obvious that the property holder had to put his hand in his own pocket for it. Further, a marked tendency has been for the campaign itself to be exploited by unscrupulous persons who secured more or less meaningless credentials or endorsements from city officials and then, armed with apparent official status, proceeded to make whatever profit they could from property holders, frequently giving little or nothing in return for the money received. This is no reflection on the legitimate pest-control operator who can play an important part in a genuine rat-control program. The over-all weakness of the rat campaign is obviously its failure to enlist the lively and intelligent support of the general body of citizens.

Strong effort is being made now in this country to substitute for the rat campaign the concept of the rat-control program. The setting up of such programs in cities has been vigorously fostered by the division of predator and rodent control of the United States Fish and Wildlife Service. Although the service does not itself do control work or initiate such programs, it does aid in laying out programs on request and in choosing and training competent executives to administer them. Because of this intimate connection with existing programs, the views of the service are of great interest. It feels that the city must

(Continued on page 562)



Alloy War-Steel reports for its physical

*OWI Photo by
Palmer, in an
Allegheny Ludlum Plant*

TESTING is an integral part of steel production at Allegheny Ludlum mills, because one of the "must" requirements for an alloy steel today is that it possesses—to the full—every one of the special properties desired by the user.

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GENERAL RATTUS

(Continued from page 560)

lead in putting its house in order by eliminating rats from parks, abattoirs, dumps, and other public properties, as well as by installing proper and adequate collection and disposal systems for garbage and trash. The public must be educated to the need for rat elimination from houses and food establishments. It must be made clear that the killing of rats and the ratproofing of buildings go hand in hand. Everyone must understand that rat control, like charity, begins at home. Although rats must be killed, partly to prevent their migration from ratproofed areas, the ratproofing of buildings and elimination of outdoor sources of food are even more necessary. The co-operation of various agencies in the city should be obtained through organization of a central committee headed by one man. This committee should include a member representing local pest-control operators, who should have a definite part in the campaign.

One of the earliest large-scale campaigns was carried out in the city of Cleveland. The following is a brief outline of the plan laid out there:

A. Publicity work by all supporting groups to arouse interest in and demand for services by stressing the reasons for the urgent need.

B. Public education by the supervisor of rat control to supply practical information to building owners and managers, their maintenance employees, feed handlers, and the public at large.

C. Action by the rat-control specialists to obtain a detailed and accurate knowledge of the degree of infestation; to inspect

(Concluded on page 564)

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ORDNANCE SPELLS IT F-U-Z-E, when referring to the mechanical device that keeps bombs safe to handle, but sets them to detonate on impact. If bombs are to be both safe and effective, fuze-timing must be accurate to a split second. To test them, Westinghouse engineers designed a new miniature wind tunnel, in which a blast of compressed air simulates speeds up to 800 miles an hour. A photoelectric cell device checks the timing to one one-hundred-twentieth of a second.

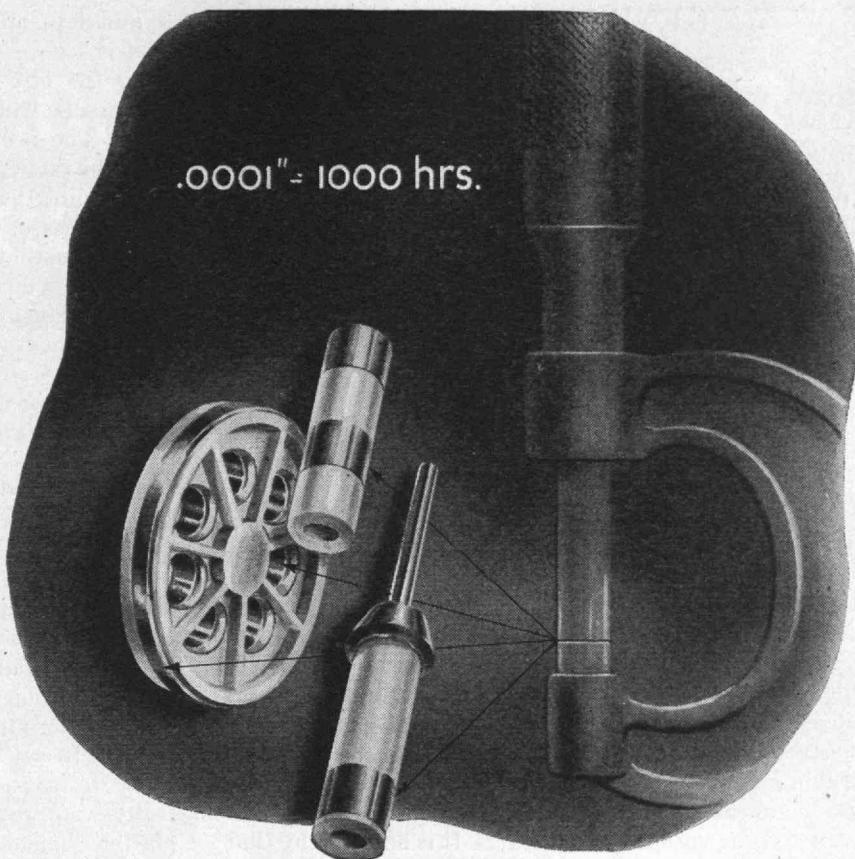
NEW FLUORESCENT DEVELOPMENTS include a *cold cathode* tube that lights up instantly; a new type of starter that eliminates blinking of fluorescent lamps; and a bulb so tiny that it can operate for several weeks on power from a single dry cell.

TOO GOOD. A short time after a large non-condensing turbine was placed in service by a large industrial company, the designer was called back to do further work in it. Reason: it was *too efficient!* Temperature of the exhaust steam was too low for plant process work. Machine is now operating with a satisfactory degree of *inefficiency*.

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NEW HURRICANE is now in service with Boeing Aircraft Company. Westinghouse has just installed an 18,000 horsepower electric motor to drive the multi-bladed fan in Boeing's new wind tunnel. One of the largest operated by a private aircraft manufacturer, the new tunnel will be able to test airfoils, etc., at speeds up to 700 miles an hour.

.0001" = 1000 hrs.



When .0001 inch = 1000 hours

Problem: To provide an air-tight joint where the insulated connectors of an airplane radio vibrator project through the metal shell. (Vibrator contacts disintegrated in *ten hours* at high altitudes, when shells were not air-tight.)

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PLANTS IN 25 CITIES OFFICES EVERYWHERE

GENERAL RATTUS

(Concluded from page 562)

premises and serve orders to ratproof, eliminate rats, and clean up; to provide free ratproofing advice and supervision; and to obtain needed rat-control ordinances.

D. Action by the citizens' committee on rat control to study various problems concerning the initiation of municipal rat-control measures, to advise the supervisor of rat control on publicity, education, and adoption of ordinances, and to obtain action by other communities in the area.

E. Co-operative action by the municipal government, when called upon by the supervisor of rat control, to aid in the application of the cardinal items of permanent control. These include sanitary, food, and drug inspections, garbage collection and dump management, demolition of dilapidated structures, adoption of building-code laws, fire-prevention inspection and the sale to the public at cost of certain ratproofing equipment possibly.

St. Louis is in the middle of a very successful program. It is essentially of the same nature as the one in Cleveland but has aroused rather more general public activity. After the initial educational phases, the division of the city which had been made by the Office of Civilian Defense was utilized so that each district had its chief, each zone its deputy, and each post its worker. This resulted in the obtaining of some 17,000 volunteer workers who were instructed in the measures to be taken and who in their turn instructed the various householders. It is noteworthy that the order of events in the program was (1) education, (2) elimination of food and harborages and the ratproofing

of buildings, and (3) extermination. The actual extermination has been done in part by groups of men borrowed from the city departments and in part by some 750 volunteers who have been specifically trained in that work. The Secretary of the St. Louis program believes that the civic pride awakened by the smoke elimination program of 1940-1941 was in a large part responsible for the success of the rat program, and we may draw the conclusion that such a program anywhere must depend upon the wholehearted co-operation of the majority of citizens. The motive power must come from the rank and file and not be imposed from above.

No figures for the actual number of rats killed are available, since most of the dead rats are never actually seen. It is just as well that this is so. In the past, too much emphasis has been placed on the number of rattails brought in, and, as we have already said, this obscures the long-range aspects of rat control and also aids in transmitting diseases to people. Cutting rattails is a mere evidence of successful minor tactics but gives no picture of the success of the planning and strategy which are as necessary in warfare on rats as in warfare between nations. Cutting off tails is no way of regaining control of your city from General Rattus.

How long are we going to put up with these unbidden guests? In rat control as in public health, we can have what we want and are willing to pay for. But we must really want rat control; no one will hand it to us on a platter. This is something to do now, not in some vague postwar era. Is John Citizen going to be vanquished by a mere rodent? Is he a man or a mouse?

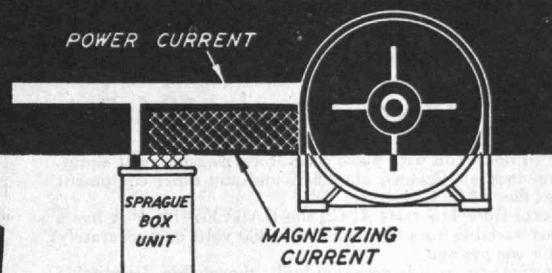
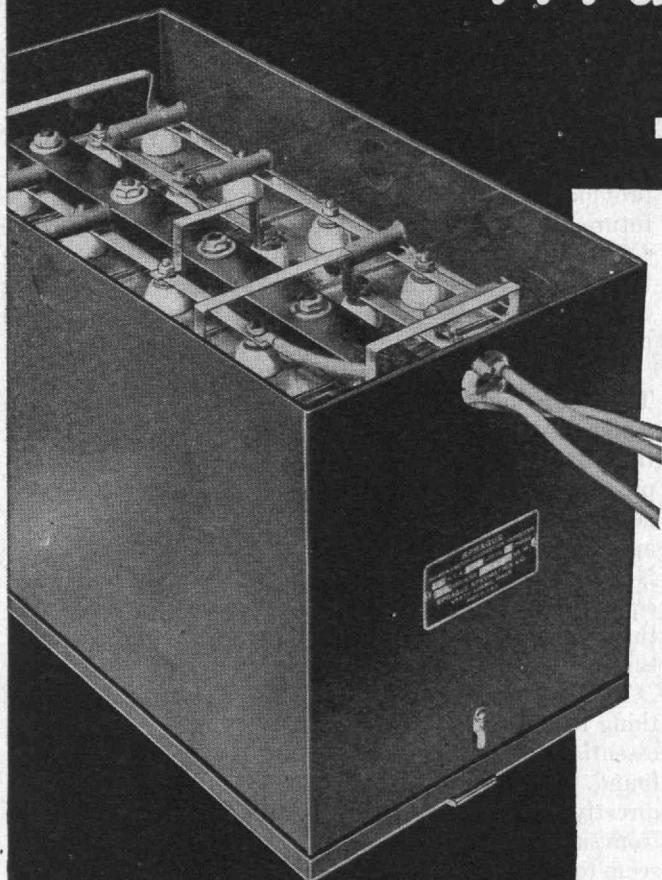


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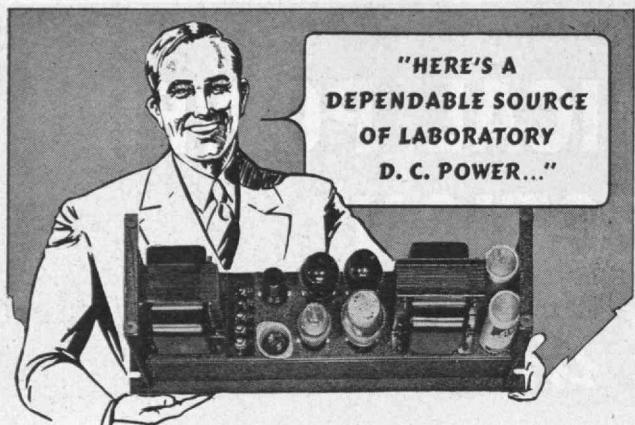
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THE OIL SITUATION

(Continued from page 548)

Perennially expressed is the hope that some revolutionary method of oil finding may bring a solution to these many problems. It is doubtful whether any such development is forthcoming. All the physical and chemical properties of oil and its associated rocks have been under careful scrutiny by specialists for some time, and to date very little new knowledge has been brought to the assistance of exploration geologists. The greatest promise ahead seems to lie in the thorough application of proved methods which to date have been responsible for the discovery of nearly one-half of the nation's petroleum. Through extension and refinement of these methods, we hope to discover the remaining half of the estimated reserves.

The annual meeting of the American Association of Petroleum Geologists recently held at Dallas, Texas, provides the keynote for exploration in the immediate future. This association, with a membership of over 4,000, represents the greatest array of scientific oil-finding talent in the world. A brief report of the recent meeting outlines the probable trends for the coming year in exploration for oil.

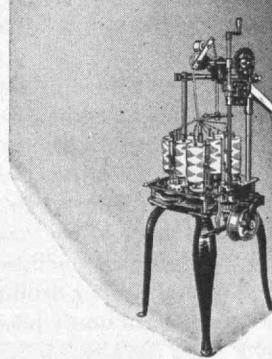
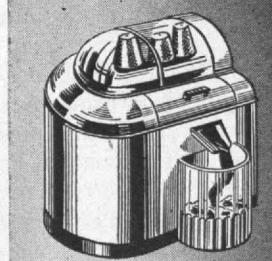
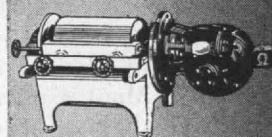
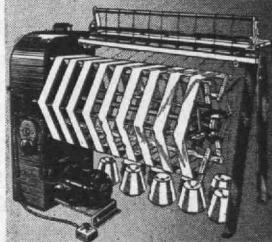
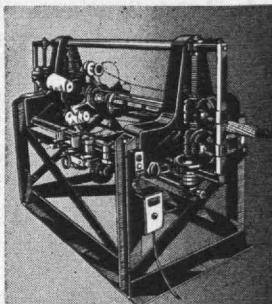
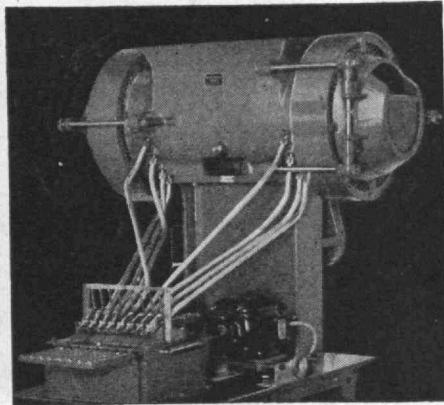
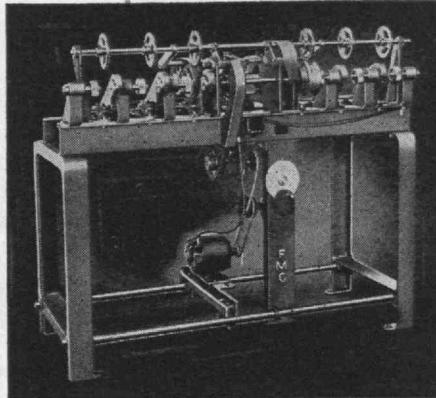
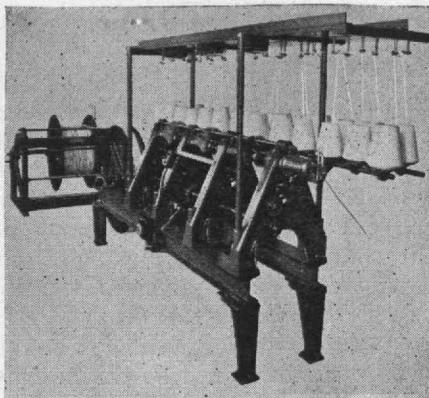
Oil finding is fundamentally a problem in geology. There are a few persons, impressed by the extent to which instrumentation has been developed, who think that the search should be turned over to others. Geophysics and geochemistry are the terms under which non-geologists press their arguments. The real distinction is the approach and manner of thinking about the problem. Nongeologists sometimes try to reduce it to formulas and equations. By so doing, they inevitably restrict their thinking and consequently lose sight of important parts of the problem.

The methods of the scientific oil prospector are something like those of the diagnostic physician. At least six essential conditions must be met at one spot if oil is to be found. The geologist cannot know all these conditions directly. He must infer the probability of their presence from such data as are available to him. If all six conditions seem to be satisfied, then he is willing to recommend to his production department that a hole be drilled in the most favorable spot.

For the past 15 years most scientifically located oil wells have had as one essential condition the location of a structural trap. This is most simply defined as a place where the attitude of sedimentary beds prevents the movement of the trapped oil to other places. Simple anticlinal folds, domes, and ridges, or combinations of these with faults and gradations in permeability account for most of the structural traps located by direct attack. In these surveys the reflection seismograph gives the most direct and most accurate results.

The seismograph employs the sonic echo as its fundamental working principle. A small charge of dynamite exploded in a shallow hole at the surface of the ground is the source of sound. Part of the waves travel vertically into the earth; if they encounter one or more acoustic discontinuities, an echo occurs at each of these horizons. The reflected wave is received at the surface by electromagnetic detectors, amplified, and recorded on a moving photographic film. A number of these records are taken at

(Continued on page 568)



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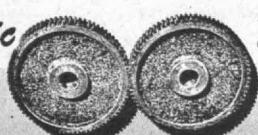
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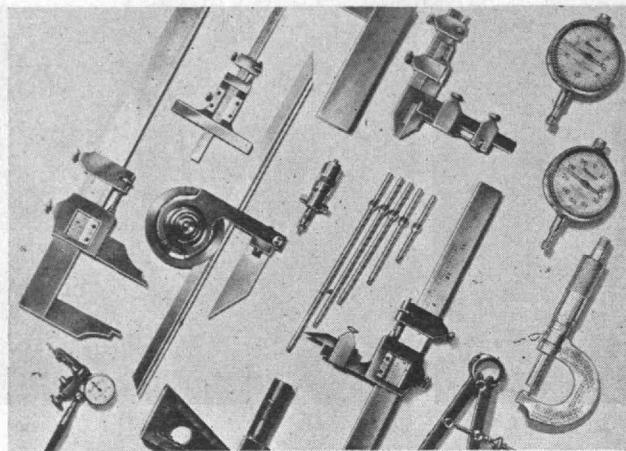
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THE OIL SITUATION

(Continued from page 566)

a single shot point, embracing the sedimentary column from 2,000 to 20,000 feet. By calibration of the velocity of the waves at wells in the area, the exact depth to various reflecting horizons can be computed. This method gives a map which represents the paleogeography of ancient times. On it will appear structural features pertinent to the accumulation of oil. Even though the geologic section may be traversed by one or more great unconformities, the attitude of key horizons can be mapped with satisfactory accuracy, usually plus or minus 25 feet.

Indirect methods of approach to structure measure the distribution of the earth's gravitational and magnetic fields. They assume that anomalies result from the distribution of the mass of basement rocks. The depth of the anomalies cannot ordinarily be computed accurately. If features so discovered are of large size, the disturbances may be caused by variations in the composition of the disturbing rocks rather than by the distribution of their mass. Such anomalies have no bearing on accumulations of petroleum.

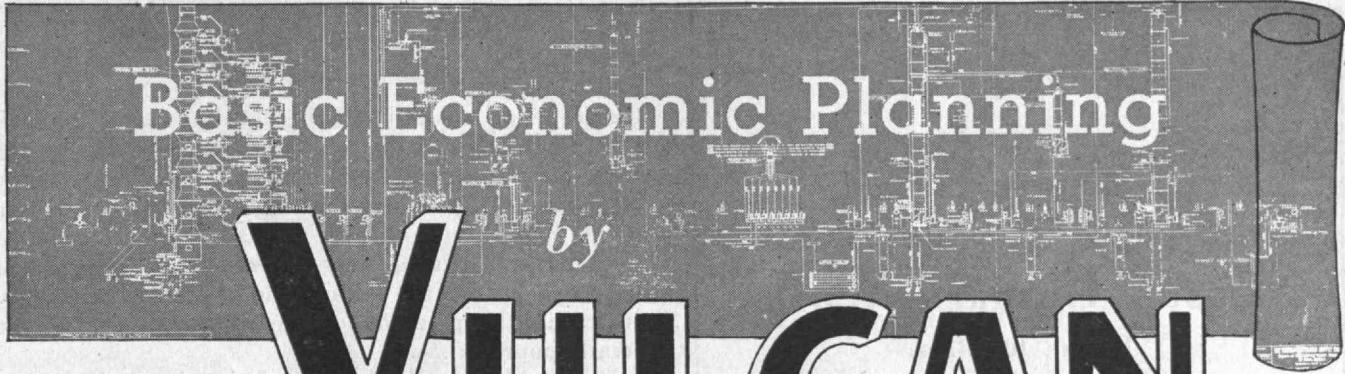
Measurements of the electrical resistivity of rocks in place and of the potential distribution of an induced electromagnetic field are of use in determining subsurface structure provided no shallow sheets of conducting fluids or rocks are present. To depths of the order of 3,500 feet, electrical methods have been of great use, particularly in reconnaissance surveys. Recent developments in electrical methods may promote further application of them.

At present nearly 400 geophysical parties are at work in the United States. Of these, 270 are reflection seismograph parties, 95 are gravity parties, and the rest are magnetic, electrical, and miscellaneous. This exploration represents an annual expenditure of about \$35,000,000. The total annual exploration cost of \$350,000,000 includes all other costs incidental to finding oil, such as drilling, permits, and lease expenditures. Many exploratory wells have been located without the benefit of scientific study. Others have had geologic advice. Most of the discoveries have had the benefit of all available scientific data.

Geologists and others charged with the responsibility of finding the nation's oil are thinking in three dimensions: lateral and vertical extension of their geological provinces. Authorities generally agree that one-half the nation's oil supply has been found. Most of it has come from rich deposits. The bulk of the remainder will probably come from less prolific fields. The areas containing these fields have not been thoroughly examined simply because it has not been profitable to do so. Now that it is necessary, there seems no reason to doubt that the task will be effectively done.

For every new geographical area brought into production, at least one new oil province may be buried beneath it. Deeper drilling in 1943 accounted for over 10 per cent of the year's new discoveries. We do not know what may lie beneath many of the nation's richest pools until they are pierced with deeper wells. The advantage of this area of exploration is that production and distribution facilities are already in place, and the added cost of deeper drilling is to a great extent offset by their presence. In many pools

(Continued on page 570)



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THE OIL SITUATION

(Continued from page 568)

the deeper oil is not directly beneath the shallow production. In these cases the delineation of structure by the reflection seismograph may prevent the drilling of many dry holes. The correlation of seismic and subsurface data in this manner represents the ultimate in the resolution of this precise instrument. By corrections for deviation of the deep hole from the vertical, and for changes in velocity of travel, the precision of the measurements can be greatly improved.

Structural control of accumulation is receiving less attention in developed areas as its use nears the point of diminishing returns. We read widely today of "stratigraphic traps" and "sedimentation traps." Actually it is difficult to ascribe the control of accumulation to one single factor, and in many strongly held arguments of sedimentation as a major agency it is possible to show that the attitude of reservoir rocks cannot be neglected. However, studies in sedimentation are increasing in their occurrence and importance. Some prophesy that most of the new oil will be found from these studies. It is odd that the teachings of eminent sedimentationists have been so long neglected.

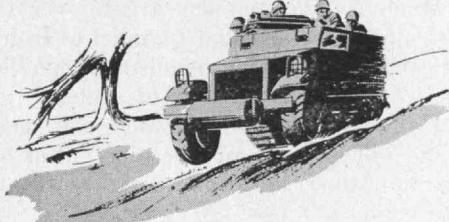
Strange as it may seem, geologists have no uniform theory of the origin of oil. Upon a few points the majority of them agree: These include the fact of oil's marine origin from microscopic organic matter. The agency or agencies by which this matter is transformed into petroleum hydrocarbons are at present unknown. Prominent hypotheses include the action of anaerobic bacteria, other biological processes, thermal-pressure effects, and alpha particle bombardment of organic matter. One of the most troublesome points is the exact nature of petroleum. Only a small fraction of its many constituents are known. The United States Bureau of Mines is making progress on this aspect of the problem, but another generation may be required to correlate this knowledge with geologic factors now under study. Little is known as to the chemical composition of the original organic endowment. The fact is well established that marine sediments of the type known as "source beds" contain sufficient organic matter to supply observed accumulations of petroleum. Even here arises a question as to the exact formation from which the oil may have come.

To solve this fundamental question the American Petroleum Institute since 1941 has sponsored its research project 43. It is being conducted jointly by Pennsylvania State College, the Scripps Institution of Oceanography, and the M.I.T. Frequent meetings are held by the three groups, together with an advisory committee of oil company geologists who receive and comment upon the reports. Under these auspices it is hoped that the origins of oil may ultimately be brought to light.

Regional studies, based upon examination of well cuttings, lead to broader concepts of petroleum accumulation than those which consider it to be controlled by local structure. Within a petrolierous province there must have been a preliminary concentration for the ultimate petroleum content to be found in the much smaller area now occupied by an oil field. Organic matter and the transformed petroleum are not abundant enough in most recent sediments to account for commercial oil deposits;

(Concluded on page 572)

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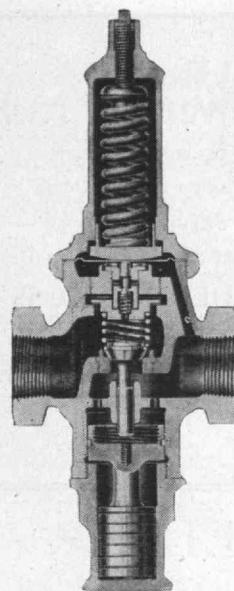
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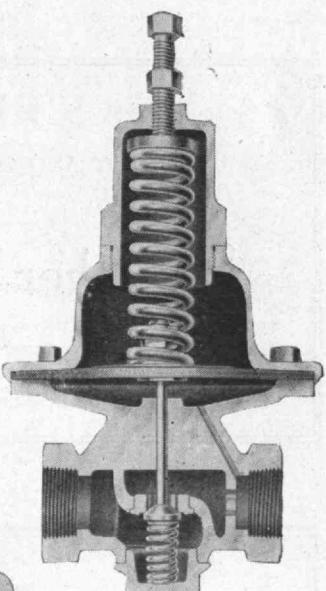
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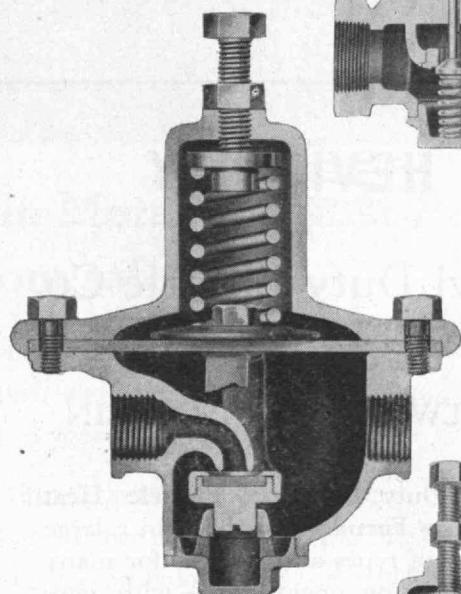
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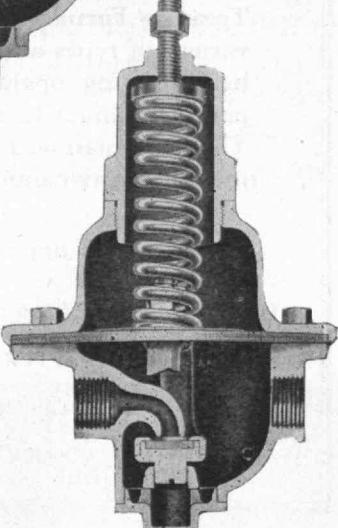
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THE OIL SITUATION

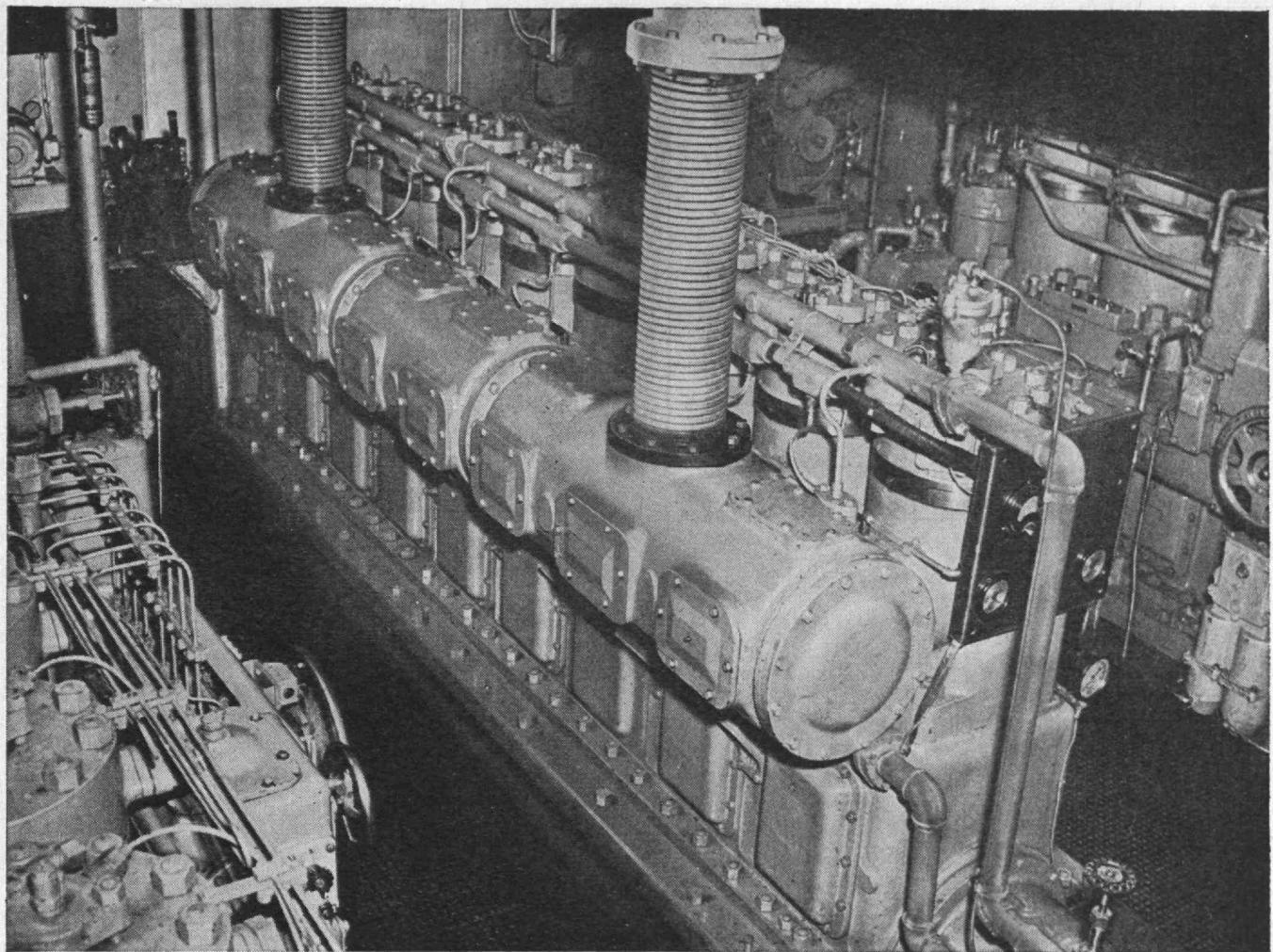
(Concluded from page 570)

hence there has arisen the idea of migration within source beds and reservoir rocks to the ultimate place where oil is found. An important factor in these concepts is the time available for the transformation of indigenous organic matter into petroleum. It seems unreasonable to suppose that liquid hydrocarbons could have moved in the required quantities through impervious shales which compose at least part of the source beds. During their burial and compaction, the permeability of shales to oil and gas is high, permitting source material and transforming agencies to migrate into more porous formations. After burial, shales are greatly compacted, losing their porosity and permeability.

Since the fraction of time during which these ingredients for the formation of oil have reposed in source beds is a small fraction of all subsequent geologic time, we have two alternatives to any theory of the origin of oil. The transforming agencies have either completed their work in the time spent in the source bed or have migrated along with the protopetroleum to the reservoir rock where they have continued to act throughout the ensuing geologic time. Much controversy has arisen over the question whether migration is lateral (parallel to bedding planes) or vertical (across bedding planes). Of significance is the fact that lateral permeability of shales is greater than vertical after compaction. Sands compact relatively little, and unless they contain substantial quantities of shale or limestone, their differential permeability is not great.

The organization of these ideas on the origin of oil, its migration, and its accumulation constitute the second type of geologic thinking which is attacking the problem of the nation's declining reserves. The results of these studies will not be immediately available. In the meantime the frantic search for oil goes on with intensive application of the same old tools. Structural control dominates the prospector today. His most useful instrument still remains the reflection seismograph. Coupled with exploratory drilling, it will find most of the scientifically located oil of the next year or two. After that perhaps the long-range ideas will crystallize.

A serious handicap to all forms of exploration is the great shortage of man power and critical equipment. More than one-third of the technical specialists in this field have left for the armed services. Others have gone into special research for combat methods and instruments. The remaining few thousand are working under increasing difficulties. Their efforts are possible only with the support of a much greater number of semiskilled workers. The labor turnover on some seismograph crews has been as high as 600 per cent. New help is inefficient; the handling of dynamite by green men is dangerous. Automotive equipment is hard to get and difficult to repair. Parts are scarce; the field men often have to overhaul and repair their own trucks. To these difficulties are added the increased cost of living expenses, the freezing of wages, and the attraction of war industries with their higher pay. Only the courage of a group of pioneers holds the industry together. Those who have stuck to their jobs deserve recognition for their faithful devotion to a patriotic duty.



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THE TEACHER'S TASK

(Continued from page 550)

est material advancement in standards of living and the marvelous progress in the arts and sciences of the past century have been in countries which were *free*—where democracy was believed in and practiced. This is not to say that there is no room for improvement in our social standards and our economic practices. There is plenty, but the progress should be evolutionary. Through such discussions as we are initiating at this conference, we hope to build understanding of each other's problems and points of view and to promote co-operation between our educational and our industrial activities, looking toward the building of a greater United States of America where truth, justice, prosperity, and happiness will ever increasingly prevail.

THE INSTITUTE GAZETTE

(Continued from page 556)

course in meteorology. The award was made "in recognition of the meritorious service rendered the Army Air Forces Training Command during World War II," by the Institute's special program in meteorology. The certificate was presented to Dr. Compton by Major Joseph F. Ratliff, Sr., commanding officer of the base unit of the Army Air Forces at the Institute, on behalf of Lieutenant General Barton K. Yount, commanding general of the Army Air Forces Training Command.

Henry G. Houghton, Jr., '27, Associate Professor of Meteorology and executive officer of the Department, presided, and in a brief address he recalled that this is the fifth group of Air Forces meteorologists to be graduated from the Institute, the first having begun its work before the Pearl Harbor attack. Lieutenant Colonel John H. Heflin, representing the Army Air Forces Eastern Technical Training Command, impressed upon the young officers their great responsibility as meteorologists.

In paying tribute to the work of meteorologists in the war, President Compton stressed the importance of accurate weather forecasting in the operations of our Air Forces in active service in the war theaters. Major Ratliff presented the aviation cadets for commission and administered the oath of office. Lieutenant Colonel H. T. Harrison, who represented the headquarters of the weather wing of the Army Air Forces, made the presentation of the commissions. The exercises were held in Walker Memorial.

Lowell Institute School

GEORGE E. RUSSELL, '00, Professor of Hydraulics, emeritus, made the commencement address at the fortieth graduation exercises of the Lowell Institute School in Huntington Hall at M.I.T. on May 24. President Compton was represented at the exercises by John W. M. Bunker, Dean of the Graduate School, who gave the graduates the official greeting of Technology, under the auspices of which the Lowell Institute School is conducted. Diplomas and certificates were presented by Ralph Lowell, sole trustee of the Lowell Institute School.

(Continued on page 576)

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THE INSTITUTE GAZETTE

(Continued from page 574)

Because of ill-health, Professor Charles F. Park, '92, director of the school since its establishment in 1903, was absent from the graduation exercises for the first time in 41 years. Professor Arthur L. Townsend, '13, recently appointed acting director of the school, presided.

Frederic H. Fay, 1872-1944

PRESIDENT of the Alumni Association in 1913 and long active in alumni and Institute affairs, Frederic H. Fay, '93, of Dorchester died on June 5. His had been a distinguished career in civil engineering, which began with a post as draftsman for the Boston Bridge Works in 1894 after he had received the master's degree from the Institute. At the time of his death, Mr. Fay was senior partner of the engineering firm of Fay, Spofford and Thorndike, which he had formed in 1914 with Professor Charles M. Spofford, '93, and Sturgis H. Thorndike, '94. He had resigned as engineer for the city of Boston, in charge of the bridge and ferry division of the Public Works Department, to engage in private practice with the formation of this firm. Mr. Fay served as consulting engineer for many Federal and local projects, notable among them being the \$25,000,000 Army supply base at South Boston in World War I and the Army base at Newfoundland in World War II. Joining the Boston Planning Board in 1918, he served on it for 20 years and also was vice-chairman of the Metropolitan Planning Division, a member of the Massachusetts State Planning Board, and a member of the New England Regional Planning Commission.

Mr. Fay, who was born in Marlboro, Mass., on July 5, 1872, was vice-president of the Alumni Association in 1902, having been a member of the executive committee from 1898 to 1900. President of the Association in 1913, he was a term member of the Institute Corporation from 1914 to 1919 and had been secretary-treasurer of his Class for 51 years. He was a former president of the American Institute of Consulting Engineers and of the Boston Society of Civil Engineers, a director of the American Society of Civil Engineers, and a trustee of Northeastern University and of the Dorchester Savings Bank. Mrs. Fay and their five daughters survive him.

To the Corporation

GEORGE A. SLOAN, President of the Nutrition Foundation of New York, was elected to special term membership on the Corporation for five years at the meeting of the Institute's administrative body on June 5.

Mr. Sloan was graduated from Vanderbilt University in 1915 and was admitted to the Tennessee bar in the same year. From 1919 to 1922 he was assistant to the chairman of the American Red Cross, and from 1922 to 1926 secretary of the Copper and Brass Research Association. He was secretary of the Cotton-Textile Institute from 1926 to 1929, when he was elected president, serving until 1935.

(Concluded on page 578)

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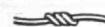
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THE INSTITUTE GAZETTE

(Concluded from page 576)

Since June, 1940, Mr. Sloan has been commissioner of commerce of the city of New York and chairman of the Mayor's Business Committee. He is also a director of the United States Steel Corporation, the Goodyear Tire and Rubber Company, the Bankers Trust Company, and the Selby Shoe Company, and is president of the Metropolitan Opera Association of New York. He was a member of President Hoover's Committee on Unemployment Relief in 1931-1932 and of the Industrial Advisory Board in 1933-1934. A member of the American committee of the International Chamber of Commerce, he is also chairman of the Consumers' Goods Industries Committee and a member of the business advisory council for the Department of Commerce, Washington.

Mr. Sloan served as a lieutenant and later as a captain in the American Expeditionary Forces in World War I. He later held the rank of major of infantry in the Officers' Reserve Corps and was a colonel on the governor's staff of the Tennessee National Guard. In 1940 he received the annual award of the National Committee for Music Appreciation. He is a director of Christodora House, New York; vice-president and trustee of the Institute for the Crippled and Disabled; and a trustee of the Community Service Society of New York. Mr. Sloan is also a member of the board of trustees of Vanderbilt University.

Jubilation

TECH Night at the Pops, which for the duration is being sponsored by the Alumni Association, took place this year on Saturday evening, June 3, with Symphony Hall sold out. It was a gala evening, and marked by extra jubilation resulting from the fact that in the afternoon Technology crews had made a clean sweep of the Charles in a three-race regatta with Harvard. Recollections of this event gave added point to the singing of the new song, "Sons of M.I.T.", by members of the Glee Club under the direction of George Sawyer Dunham, conductor, at the midpoint of the Pops program. Times in the races were slow, for all were rowed in rough water and against a head wind. In the first race, for 150-pound crews, these were the results: M.I.T. first crew, 8:18.3; M.I.T. second crew, 8:31; Harvard varsity, 8:49. Two Technology crews finished ahead of the Harvard jayvees thus: M.I.T. junior varsity, 8:17.4; M.I.T. third crew, 8:23; Harvard junior varsity, 8:44. In the Henley, closest race of the afternoon, the M.I.T. crew rowed in 8:23, with Harvard less than a second behind.

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THE ALUMNI FUND — ITS PROBLEMS AND GROWTH

HALFWAY MARK

WE'RE over the hump! We've progressed just halfway toward our objectives of 10,000 men, \$150,000. The actual figures on June 14 were 5,036 contributors and \$74,996.07. A splendid start!

One of the outstanding class performances of any year has been that of 1894, the 50-year Class. By reunion time early in June, '94 had already attained its yearly quota of contributors, had more than doubled its dollar quota, and had an amazing \$53 average — and it's still going strong.

Equally stimulating is the response from our Alumni in the services, both directly and through their families. Again this year these men are contributing to Technology's future in greater proportion than those still in civilian life. There's a considerable lift from an overseas letter such as the one recently received in the Fund office: "Have just learned that a contribution of \$5.00 was made to the Fund in my name. Enclosed is a check for additional \$20."

If you are one of the 4,500 who contributed in 1943-44 but have not yet done so this year, won't you do it now? Your continued support is truly needed.

With the Clubs

Once again the annual Technology Clubs Sweepstakes is off to a flying start. By the twelfth of June the nine entrants had really hit their strides, with Western Pennsylvania and Rhode Island out in front, reversing the order in which they came in to win and place last year. The first five were all well ahead of the general alumni percentage figure, although only three had higher averages, the Southwestern Association with \$76.50 being out of sight of all the rest. The summer's ahead of us. Next fall it may be a different picture entirely!

	Per cent of contributors *	Average contribution
Western Pennsylvania.....	37	\$16.60
Rhode Island.....	33	14.90
Philadelphia.....	28	22.20
Northern New Jersey.....	27	13.60
Cincinnati.....	24	11.50
Southwestern Association.....	12	76.50
Northern Texas.....	11	11.05
Central Pennsylvania.....	11	14.50
Buffalo.....	8	14.30
Alumni body as a whole.....	15	14.95

* Based on number of active members.

TECHNOLOGY MEN IN ACTION

M.I.T. MEN AT WAR

Up to June 12 over 5,700 Institute Alumni, including 26 Admirals, 1 Commodore, and 70 Generals, were recorded as being in the active naval or military services of the United Nations. The new additions this month are Brig. Gen. Roland P. Shugg '23 and Rear Adm. Malcolm F. Schoeffel '25. There were 70 Alumni who had already been decorated.

NEW DECORATIONS

- 931 Goodhand, O. Glenn, *Capt.*, U.S.A., Silver Star—"For gallantry in action on the Anzio Beach head . . .".
 1934 Soule, Rufus A., *Lt. Comdr.*, U.S.N. Legion of Merit—"For exceptionally meritorious conduct in the performance of outstanding services as commanding officer of a destroyer escort during the advance landings in Anzio."
 1938 Dent, Frederick R., Jr., *Col.*, U.S.A. Legion of Merit—for action over Germany.
 1939 Kittredge, Harry C., Jr., *2nd Lt.*, U.S.A. Distinguished Flying Cross—"For extraordinary achievement while participating in aerial flights in Southwest Pacific."
 2-44 Freeman, Roger M., Jr., *1st Lt.*, U.S.A. Air Medal, Four Oak Leaf Clusters—Has been wounded, now returned to action.

NEW LISTINGS

U.S.A.

- 1935 Woolf, Ralph B., *Capt.*
 1938 Nalle, Edmond R., *Lt.*
 1941 Azgapetian, Ahzat H. V., *Lt.*
 1942 Fogg, Clarence H., Jr., *Lt.*
 2-44 Ackerman, Sumner, *Pvt.*
 Acteson, James A., Jr.
 Adler, Charles S., *Cadet*
 Adsit, Ray M., *Pvt.*
 Allen, Robert W., *A.C.*
 Almeida, Americo F., Jr.
 Balise, Peter L., Jr., *Pvt.*
 Banus, Mario D., *Pvt.*
 Barnaby, Robert H., *Corp.*
 Barr, George M., *Pvt.*
 Bartz, Robert V.
 Becker, Melvin, *Pvt.*
 Beckington, Arthur R., *Pvt.*
 Beecher, Norman, *Pvt.*
 Benjamin, Roland, Jr., *Pvt.*
 Berinsky, Stanley
 Bersohn, Richard, *Pvt.*
 Bessen, Seymour, *Pvt.*
 Bettes, Richard S., *Pvt.*
 Biedenharn, Lawrence C., Jr., *Pvt.*
 Bishop, Warren A., *Pvt.*
 Blattner, David G., Jr., *O.C.*
 Blatz, Frederick J., Jr., *Pvt.*
 Boettger, John P., *2nd Lt.*
 Bohr, Alexander H., *Pvt.*
 Botten, William H., *Pvt.*
 Breck, Robert G., Jr., *Pvt.*
 Breen, John E., *Pvt.*
 Brett, William H., *3d, Pdt.*
 Breymann, John B., *3d, Pdt.*
 Broderic, Stuart C., *Pvt.*
 Brodsky, Harold M., *Pvt.*
 Brogle, Albert P., Jr., *Pvt.*
 Bromfield, Burton A., *Pvt.*
 Brown, David M., *Pvt.*
 Brown, Frank E., *Pvt.*
 Brown, George E., *2nd Lt.*
 Buck, Robert D.
 Burdakin, John H., *Pvt.*
 Burdick, George E., *Pvt.*
 Burlingham, Michael, *Lt.*
 Byrne, Robert M., *Corp.*
 Callner, Norman H., *Pvt.*
 Carey, Francis D., *Pvt.*
 Carmody, Thomas W., *Pvt.*
 Carroll, Frank E., Jr., *Pvt.*
 Carter, Richard L., *Pvt.*
 Caswell, Randall S., *Pvt.*
 Cavanaugh, Frederick J., Jr., *Pvt.*
 Cavicchi, Richard H., *Pvt.*
 Chaplinsky, Andrew, *2nd Lt.*
 Chin, Frank K., *Pvt.*
 Church, Dudley F., *Corp.*
 Clark, William W.
 Clarke, Robert I., *O.C.*
 Clew, Harry F., Jr., *Lt.*
 Cochran, Edward W., *O.C.*
 Coffey, William N., *Corp.*
 Cohen, Henry, *Pvt.*
 Coleman, Robert V., *Pvt.*
 Coleman, Samuel D., *A.C.*

★Killed in Action

Cook, Carter G., *Pvt.*Cooper-Smith, Robert E., *Pvt.*Cornell, John A., *Pvt.*Corona, Alphonse A., Jr., *Pfc.*Cotchett, Richard S., *Pvt.*Cummings, Lawrence T., Jr., *Lt.*Curry, Richard, *Pvt.*Daggett, Norman L., *2nd Lt.*Davey, Francis H., *A.C.*DeAgazio, Emile A., *Pvt.*DeBell, Frederick D., *Pvt.*DeBell, John M., Jr., *Pvt.*Delano, Warren B., *Sgt.*Demarkles, Louis R., *Pvt.*Dershowitz, Arthur F., *Pvt.*Dew, Robert J., Jr., *Pvt.*Dickey, Harry L., Jr., *A.C.*

Dickson, Markham A.

Dillon, Edward F., *Pvt.*Dowd, Laurence E., *Pvt.*Dube, Pierre W., *Corp.*Dunlap, Wallace P., Jr., *Pvt.*Eberhard, Kenneth M., *Pvt.*Eberly, James R., *2nd Lt.*Ely, Paul F., Jr., *2nd Lt.*Engel, Klaus C., *Pvt.*Engelman, William C., *A.C.*Eno, Robert F., *Pvt.*Eyman, Carl E., Jr., *2nd Lt.*Faurot, Robert S., *Pvt.*Fennessey, John F., *Cadet*Feroli, John A., *Pvt.*Fischler, Jerry E., *Pvt.*Fisher, Robert G., *Pvt.*Flanigan, John, *Pvt.*Flannery, Thomas J., Jr., *O.C.*Floden, John G., *Pvt.*Flynn, John J., Jr., *Pvt.*Fowler, Charles E., *Sgt.*

Fowler, Paul I.

Freeman, Roger M., Jr., *1st Lt.*Gamborg, Malvin, *Pvt.*Gardner, John B., *Pvt.*Garrard, Richard F., *Pvt.*Gastrich, Henry G., *Pvt.*Gavin, William W., Jr., *Pvt.*Glendening, John O., *Pvt.*Goldberg, Abraham J., *Corp.*Goldstein, Irwin, *T.5*Grant, Richard C., *A.C.*Greenman, Norman L., *Pvt.*Halle, Mitchell J., *Lt.*Hammarstrom, Sten, *Pvt.*Hanson, Richard L., *Pvt.*Hardie, John F., Jr., *Pvt.*Harper, William E., *Pvt.*Harris, Holton E., *Pvt.*Harris, Leonard, *Pvt.*Hayman, Robert C., *Pvt.*Heckel, Aldred H., Jr., *Pvt.*Henrich, Joseph A., Jr., *Pvt.*Hodgdon, Earle B., *Pvt.*Hoffman, Frederick L., *Pvt.*Hopewell, Frederick H., *O.C.*Hopkins, Peter S., *Capt.*

Hopkins, William R.

Hyatt, Kent

Ingham, George A., *Corp.*

Isaacs, Robert M.

Jaeger, Walter A., *Pvt.*Jealous, David, *Pvt.*

Jerome, E. Raymond, Jr.

Jevon, Robert W., *A.C.*Johnson, John F., *Pvt.*Johnson, Leonard B., *Pvt.*Kahl, DeLois, Jr., *Pvt.*Karol, Arthur S., *Pvt.*Kendall, Norman H., *Pvt.*Kheiralla, Ahmad A., *A.C.*King, Martin, *O.C.*Knapp, Norman T., *Pvt.*Kogan, Jay M., *Pvt.*Kratz, Robert F., Jr., *Pvt.*Kulda, Richard J., *A.C.*

Lamade, Ralph M., Jr.

Lampert, Samuel H., *Pvt.*Laventhal, Harry S., *Pvt.*Lavery, Hugh H., *Pvt.*Lawson, James T., *Pvt.*Lawton, Henry D., Jr., *Pvt.*Lewis, James E., Jr., *A.C.*Lichten, Aldred R., *Corp.*Lindstedt, Raymond A., *A.C.*Livermore, Richard S., *2nd Lt.*Lobsitz, Jules L., *Pvt.*Lohman, Robert L., *Pvt.*Looker, Edward C., Jr., *A.C.*Losco, Fiorenzo D., *Pvt.*

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1915 Staub, John F., *Lt. Comdr.*1921 Johnston, S. Paul, *Lt. Comdr.*1925 Davis, Stanley W., *Lt.*1933 Murphy, Russell S., *Lt.*1934 Schwarz, Herbert R., *Lt. (j.g.)*1935 Marshall, Walton H., *Lt.*1937 Blessing, Charles A., *Lt. (j.g.)*1938 Cody, Peer J., *Ens.*1939 Zuckerman, Bernard, *S.t.c.*1940 Williams, Arthur R., *Lt. (j.g.)*1941 Rudd, Budd R., *A.S.*1942 Miller, Adam J., *2d, Ens.*1943 Strohmeyer, Charles J., *Ens.*1943 Theriault, George H., *Lt. (j.g.)*1944 Adair, Jamie, Jr., *Lt.*

1944 Bavicchi, John A.

1944 Benepe, Bruce T., *Ens.*1944 Bliss, Warren E., *Ens.*1944 Bowes, Henry N., *Mid.*1944 Brown, Kenneth S., *Lt.*

1944 Bush, Thomas A., Jr.

1944 Cahoon, Robert L.

1944 Caswell, Richard B., *Lt. (j.g.)*1944 Chase, Dana C., *Ens.*1944 Cole, Everett J., Jr., *A.S.*1944 Connell, Harold, Jr., *Ens.*1944 Corwin, Harry R., Jr., *A.S.*1944 Cunningham, Herbert J., *S.t.c.*1944 Cypher, George A., *3d, Mid.*1944 Dodge, Austin P., *Ens.*1944 Egbert, John E., *Mid.*1944 Ela, Dennett K., *Lt.*1944 Emberton, George E., Jr., *Ens.*

1944 Falconer, Stanley

1944 Flowers, Langdon S., *Mid.*1944 Germer, John H., *Ens.*1944 Gilfillan, John T., Jr., *Mid.*1944 Griffith, Frederick M., Jr., *A.S.*1944 Hatfield, Richard V., *Ens.*1944 Hausman, John E., *Lt.*1944 Hayes, Vernon R., *Lt.*1944 Hedgecock, Russell H., *Lt.*1944 Heilmann, Paul M., *2d, A.P.*1944 Hird, Martin C., *Mid.*1944 Hunn, John L., *Mid.*1944 Huron, Francis H., *Lt.*1944 Jakel, Arnold E., *Lt.*1944 Jencks, Kimball, *Mid.*

1944 Kaufman, Joseph L.

1944 Kispert, Malcolm G., *Mid.*1944 Knight, Stephen J., Jr., *Ens.*1944 LeBaron, Francis N., *Mid.*1944 Lednicki, John A., *Cox.*1944 Leon, James, *Ens.*

1944 Lofores, Leonard T.

1944 McConnell, William W., *A.S.*1944 McLaughlin, Robert A., *Mid.*1944 Maconi, Richard C., *Ens.*1944 Madwed, Albert, *Ens.*1944 Marenholz, Pete B., *Mid.*

1944 Margleith, Andrew M.

1944 Marr, Robert M., Jr., *Ens.*1944 Marsh, Richard M., *Lt.*1944 Mavor, James W., Jr., *A.S.*1944 Middleton, John R., Jr., *Lt.*1944 Myerson, Harry S., Jr., *Ens.*1944 Nelson, Nels R., *Lt.*1944 Dupuy, Albert E., *Lt. Comdr.*1944 Nelson, Robert M., *Lt. to Lt. Comdr.*1944 Bailey, George W., *Lt. Comdr.*1944 Denslow, Jerry, *Ens. to Lt.*1944 Markell, John, Jr., *A.C. to Ens.*1944 Muller, John G., *Ens. to Lt. (j.g.)*1944 Rouffa, Robert S., *Ens. to Lt. (j.g.)*

1944 U.S.C.G.

1944 1917 Wood, Walter C., *Lt. to Lt. Comdr.*

1944 CASUALTIES

1937 †Wirtz, Elmer C., *Capt.*, U.S.A.

(Previously reported prisoner of war—Japan.)

1939 †Chestnut, Albert H., *Lt.*, U.S.A.

(Previously reported missing in action.)

1940 †Weinbrenner, George R., *Maj.*, U.S.A.—Germany.1941 ★Atwater, Charnley K., *Lt.*, U.S.A.—Sardinia.1942 2-44 †Vail, Derrick T., *3d, Sgt.*, R.C.A.F.—Off the coast of England.1942 Deylitz, Paul L., *Capt. to Lt. Col.*

1942 *Died in Service

1942 **Wounded

2-44 †Missing in Action

2-44 †Prisoner of War

2-44 *Killed in Action

2-44 †Died in Service

2-44 **Wounded

(ii)

ALUMNI AND OFFICERS IN THE NEWS

Achievement

¶ By ROBERT S. WILLIAMS '02, awarded a certificate of appreciation from the office of the Quartermaster General "for outstanding contribution in the war effort as a member of the research and development branch of the military planning division."

¶ By LOUIS E. GARONO '35, awarded the War Department's emblem "for achievement over and beyond the demands of duty in the production of chemical warfare munitions at Pine Bluff Arsenal, Ark."

¶ By ISADORE AMDUR and ARTHUR von HIPPEL, staff, elected fellows of the American Academy of Arts and Sciences at its annual meeting on May 10 at 28 Newbury Street, Boston.

¶ By LOUIS B. SLICHTER, staff, elected a member of the National Academy of Sciences at its spring meeting held in Washington on April 25.

Responsibility

¶ For JEROME C. HUNSAKER '12, elected treasurer of the National Academy of Sciences for a further term of four years, until June 30, 1948.

¶ For JOEL D. HARVEY '22, elected vice-president of the Massachusetts Society of Certified Public Accountants at its annual meeting in Boston on May 22.

¶ For FRANK D. MERRILL '32, in the news in March as leading the first all-American penetration into Burma.

Rendered

¶ By CARL J. TRAUERMAN '07, an address at Butte on April 25 before the Montana section of the American Institute of Mining and Metallurgical Engineers.

¶ By JOHN T. RULE '21, a talk at the spring meeting of the American Society of Mechanical Engineers, April 3-5, in Birmingham, Ala.

¶ By EDWARD R. SCHWARZ '23, as chairman, on the seventh annual Research Day in Boston, May 26, a panel discussion on "Textiles Today and Tomorrow" in which GILES E. HOPKINS '26 and W. RUPERT MACLAURIN, staff, participated, and WALTER J. HAMBURGER '21 had charge of exhibits.

¶ By THOMAS R. SMITH '32, a discussion of "Post War Developments" on June 9 in Des Moines, Iowa, at the 40th annual Iowa-Nebraska state association of the National Association of Power Engineers.

¶ By DOUGLAS C. MACMILLAN '34, a lecture on "The Measurement of Propulsive Power on Shipboard" on May 11 before the marine power division of the American Society of Mechanical Engineers. Mr. MacMillan and RICHARD H. TINGEY '27 were among the leaders of a symposium on high-pressure and high-temperature machinery for ship propulsion held in New York on April 28 by the metropolitan section of the Society of Naval Architects and Marine Engineers.

¶ By DIRK J. STRUIK, staff, an address on March 24 at the opening of a Boston branch of the Netherlands Information Bureau at 555 Boylston Street, and on April 20 before a current events group of the Boston unit of the American Jewish Congress.

Written

¶ By SAMUEL E. LUNDEN '21, a pamphlet, *Community Development through an Exposition for Los Angeles*, Haynes Foundation, Los Angeles, 1944.

¶ By ROBERT HENDERSON '30, "A Comparison between the Chute and Grizzly System and the Slusher System at the Climax Mine," American Institute of Mining and Metallurgical Engineers, Inc., T.P. 1715 in *Mining Technology* for May.

¶ By RICHARD S. MORSE '33, an article, "High Vacuum in Industry," in the *Scientific Monthly* for May.

¶ By ANTOINE M. GAUDIN, staff, with FRANK W. BOWDISH '43, "Surface Measurement by van der Waals Adsorption," American Institute of Mining and Metallurgical Engineers, Inc., T.P. 1666 in *Mining Technology* for May.

DEATHS

* Mentioned in class notes.

¶ ALBERT P. CONE '85, April 30.
¶ GEORGE E. SYLVESTER '87, January 17.*

¶ C. LEONARD BROWN '88, April 30.*
¶ LYMAN A. FORD '89, October 17.
¶ THOMAS J. STURTEVANT '90, April 20.*

¶ ELTON D. WALKER '90, February 24.*

¶ MARGARET E. MALTBY '91, May 3.*
¶ FREDERIC H. FAY '93, June 5. (See "The Institute Gazette.")

¶ THOMAS P. CURTIS '94, May 28.
¶ NATHAN B. DAY '94, April 26.*

¶ FREDERIC P. SIMONDS '94, April 19.*
¶ ALLAN P. BROWN '95, May 11.

¶ ALFRED T. TAYLOR '95, March 28.

¶ DONALD C. CAMPBELL '98, September 24, 1942.*

¶ HENRY D. OSGOOD '98, January.*
¶ THOMAS M. ROBERTS '98, January 10.*

¶ W. MALCOLM CORSE '99, June 3. Secretary of his Class for 31 years, Mr. Corse was very active in alumni affairs. He had also served as secretary and president of the Washington Society of the M.I.T., having for many years maintained an office in Washington as consultant in metallurgical and chemical engineering.

¶ MAURICE F. RICHARDSON '99, April 21.

¶ EDWIN F. SAMUELS '99, June 3.
¶ FREDERICK G. CLAPP '01, February 18.*

¶ CHARLES D. BREWER '02, June 3.
¶ CHARLES W. EWART '02, October 31.
¶ J. HOWARD REDFIELD '02, April 17.
¶ ARTHUR H. EATON '04, February 22.*

¶ WILLIAM H. BEERS '05, January 18.
¶ ALBERT W. WALKER '05, June 15, 1943.*

¶ SIDNEY L. DAVIS '06, March 29.*
¶ GEORGE C. FURNESS '06, April 10.*
¶ FREDERICK E. MACMILLAN '06, September 8.*

¶ PAUL F. MANN '06, February 7.*
¶ BURROWS MOREY '06, May 13.
¶ LAWRENCE ALLEN '07, June 9.*
¶ A. SHIRLEY BLACK '07, April 27.*
¶ RALPH H. CROSBY '07, June 18, 1943.*

¶ OTTO A. JOHNSON '07, March 7.
¶ JOHN C. BROOKS '08, April 28.*
¶ AARON R. MERRITT '08, December 18.*

¶ ALLAN SEYMOUR '08, July 30, 1943.*
¶ MATTHEW F. DURGIN '09, May 14.*
¶ RAYMOND L. JONES '10, April 5.
¶ WALTER V. ROHLFFS '12, January 6.
¶ HOWARD S. MACKIRDY '19, November 26.*

¶ CLIFFORD K. RATHBONE '20, March 27.*

¶ WILLIAM CLIFT '21, July 28, 1943.*
¶ FREDERICK M. GAHAGAN '21, July 1943.*

¶ JOHN C. RIEDER '22, February 23.
¶ LEONARD L. ELLIS '30, January 30.*
¶ WILLIAM I. ALLEN '31, December 28.

¶ FRANK GUARINO '33, March 22.
¶ JUSTUS U. STEELE '34, April 12.*
¶ ROBERT J. GREER '35, May 16.

¶ FRANCIS L. BLACK '36, January.
¶ ELLIS J. SIEGEL '37, January.
¶ CHARNLEY K. ATWATER '41, March 19.*

¶ JOHN J. NAGLE, 3D, '41, April 29.*
¶ DAVID W. STAMPER '42, May 16, 1943.*

NEWS FROM THE CLUBS AND CLASSES

CLUB NOTES

Technology Club of Chicago

A luncheon was held on May 22 at the University Club in Chicago, for the purpose of electing officers and directors of the Club for the 1944-1945 term. A good turnout was on hand, there being approximately 75 members present. The ticket as chosen by the nominating committee was presented, placed in nomination, and duly elected. The new officers and the directorate are as follows: President, Sherry O'Brien '17; Vice-president, Edmund G. Farrand '21; Secretary, Elmer D. Szantay '35; Treasurer, Robert W. Van Kirk, Jr., '18; directors: (term expiring 1945) Joseph K. Roberts '28, G. Radcliffe Stevens '17; (term expiring 1946) John M. Frank '07, George E. Wallis '09; (term expiring 1947) John W. Barriger, 3d, '21, Thomas F. Russell '27; chairman of board of directors, Louis H. G. Bouscaren '04, past President; ex officio, Harold B. Harvey '05, immediate past President.

Those attending were as follows: 1887: Lonsdale Green, R. E. Schmidt; 1896: R. D. Flood, Joseph Harrington; 1897: D. D. Cassidy; 1902: W. N. Brown; 1903: L. L. Hunter; 1905: E. G. Allen, H. B. Harvey, G. B. Jones, F. D. W. Webster; 1906: H. S. Philbrick; 1907: J. M. Frank, F. B. Schmidt; 1908: W. F. Dolke; 1909: T. B. Black, H. S. Pardee; 1910: D. V. Williamson; 1916: F. W. Bucknam, S. A. Hoffman; 1917: A. C. Carlton, P. M. Flagg, L. A. Ferguson, Jr., Sherry O'Brien; 1918: H. M. Barber, W. H. Robertson, R. W. Van Kirk; 1919: H. A. Herzog, B. H. Sherman; 1920: F. J. Foley, M. B. Knox, W. D. Shepard; 1921: R. D. Cooper, E. G. Farrand, A. J. La Pointe; 1922: J. N. DuVernet, A. E. Melwig; 1923: F. G. Clement, P. L. Coleman; 1925: D. H. Keck, F. D. O'Neil, J. H. Raferty, Louis Sheldon; 1926: R. J. Chapin, J. H. Wills, W. M. Woll; 1927: P. W. Creden, Francesco Marcucella, T. F. Russell; 1928: H. L. Geiger, J. G. Praetz; 1929: R. E. Allen, W. A. Key; 1931: E. E. Langeland, L. K. Spruill; 1932: W. S. Roberts, J. A. Robertson; 1933: L. S. Brown; 1935: L. E. Packard, Arthur Rapport, J. J. Ryan, E. D. Szantay; 1938: L. C. McEvoy, Jr.; 1939: J. W. Mohlman, R. M. Soria; 1940: Bonner Hoffman, B. L. Weller; 1942: A. E. Douyard. — ELMER D. SZANTAY '35, *Secretary*, Sandee Manufacturing Company, 3945 North Western Avenue, Chicago 18, Ill.

Indiana Association of the M.I.T.

A long time has elapsed since any word from the Association has appeared in these columns; and now perhaps it would be more proper to say that this note is "for" the Association rather than "from" it. War duties have long since claimed our official Secretary, and he is therefore no longer in Indianapolis. Similarly our Chairman is engaged in war work. With the consent of the latter, however, and under urge from

several resident Alumni, both old and newcomers, the undersigned has consented to take over temporarily and proceed with the task of rejuvenation of activities.

We are looking forward to a get-together of some sort this summer. It is hoped that all eligibles within this territory can be reached with proper notice at the time. Thus the purpose of this note becomes apparent: Will any Alumnus of central Indiana who suspects that his present address may not be properly recorded on our list, please drop a line to the Acting Secretary, or notify Thomas G. Harvey '28, care of Monarch Steel Company, 545 West McCarty Street, Indianapolis (Telephone: Riley 2422). — J. LLOYD WAYNE, 3d, '96, *Acting Secretary*, 1834 North Alabama Street, Indianapolis, Ind.

M.I.T. Club of East Tennessee

The annual meeting of the Club took place at the S and W Cafeteria in Knoxville, Tenn., on May 22, 26 members and 22 guests attending. Besides the business meeting and selection of officers, a musical program and motion pictures were provided. The officers elected for the ensuing year were: President, B. R. Fuller '09, I, T.V.A., Knoxville, Tenn.; Vice-president, Knoxville section, Arthur R. Holbrook '04, I, T.V.A., Knoxville, Tenn.; Vice-president, Chattanooga section, G. Everett Farmer '22, VI, T.V.A., Chattanooga, Tenn.; Treasurer, G. N. Burrell '13, II, T.V.A., Knoxville, Tenn.; Secretary, Albert S. Peet '09, II, Knoxville Glove Company, Knoxville, Tenn.; member of executive committee, Dana M. Wood '06, I, T.V.A., Knoxville, Tenn. Resolutions were adopted on the deaths of George E. Sylvester '87, I, and Theodore B. Parker '11, I. — ALBERT S. PEET '09, *Secretary*, Knoxville Glove Company, P. O. Box 138, Knoxville, Tenn. BERNARD R. FULLER, *Acting Secretary*, 3212 Linden Avenue, Knoxville, Tenn.

Montreal Technology Club

Dr. Compton was the guest of honor and speaker at the annual dinner of the Graduates' Society of Ecole Polytechnique, the faculty of engineering of the University of Montreal, on February 5. He was the recipient of the honorary degree of doctor of applied sciences, which was conferred upon him by the Rector of the University, Monseigneur Olivier Maurault, C.M.G., P.D. After the conferring of the degree, Dr. Compton said a few words of thanks in French.

During the dinner, Dr. Compton delivered a message to the graduates of Ecole Polytechnique, and his talk dealt with the role of technological institutions in the war and after the war. He mentioned some of his experiences during his recent trip to the Southwest Pacific, and he commented at length on the importance of technological research and development carried on by several of the Allied Nations, mentioning

in particular the part that is being played during the war by the technological institutions. "It would be extremely shortsighted policy," said Dr. Compton, "for any government to permit a weakening of its important educational institutions. Wise statesmanship and public interest call for a maintenance and even an increase in the effectiveness of institutions like the Ecole Polytechnique and the Massachusetts Institute of Technology and others of the same type." He did not overlook the financial problem which these institutions will have to solve after the war in order to carry on with the expanded programs which have been organized for the war activities and which are not to be laid aside after the war is over.

The Graduates' Society of Ecole Polytechnique had graciously invited to this annual meeting all the M.I.T. Alumni living in Montreal and its vicinity, and approximately 65 of them were present at the dinner. They were given the opportunity to meet Dr. Compton at a reception which followed the dinner, and very happily through this initiative Technology men in Montreal were able to get together, causing a considerable revival of interest.

The Montreal Club has been in existence for a good many years, but has been inactive for the past ten or twelve. Through the initiative of S. C. Dunning '17, A. D. Ross '22, and Henri Gaudefroy '34 the Club has been reorganized; one meeting has already been called on May 17, and it proved to be a well-received and well-attended one. Many Alumni from the classes of 1902 to 1944 were present, 41 having accepted the invitation, out of 104 convocations sent. Quite a few others sent their regrets and hoped there would be more meetings to come. An expression of opinion was requested from those present regarding the future activities. All were unanimous for such get-togethers but were against any very elaborate programs. An organizing committee was set up temporarily until officers can be nominated and the Club is again in a position to operate normally. Mr. Ross explained his duties as honorary secretary of M.I.T. for eastern Canada and urged those eligible to belong to the Alumni Association and contribute to the Alumni Fund. Everyone enjoyed the meeting and looks forward to the next one to be called in the fall.

M.I.T. Club of Northern New Jersey

Among the 110 members who gathered at the Newark Athletic Club for the spring smoker on May 18, there were three men who deserve special mention for having attended every regular meeting of the Club during the nine years of its existence. These old reliables are G. G. Holbrook '10, J. F. Maguire '17, and C. A. Clarke '21. Our President, Newman Drake '30, opened the meeting with a short business session which included the election of officers for the ensu-

ing year. The following is a partial list of those who will serve: President, George A. Chutter '21; Vice-president in charge of program, A. R. Brooks '17; Vice-president in charge of membership, Kebe Toabe '15; Assistant Vice-presidents, H. F. Ballard '09, Sumner Hayward '21, and D. D. Way '19; Secretary, Ralph S. Wetsen '21; Assistant Secretary, F. O. Pierson '29; Treasurer, Fred E. Kowarsky '21; Assistant Treasurer, P. H. Kirwin '28. Frank Maguire '17, director of the Club's scholarship activities, announced that 19 applicants were interviewed at a recent meeting of the scholarship committee, which was attended by Deans Lobdell and Pitré of the Institute. Among the nine applicants selected for awards, one was recommended by our committee to receive the New Jersey regional scholarship.

A very interesting talk on "Chemically Treated Woods" was given by J. F. T. Berliner of the E. I. du Pont de Nemours Company, who described a process of chemical impregnation of wood which increases its hardness to that comparable with metal, gives it dimensional stability, makes it acidproof and fire-resistant. **RALPH S. WETSEN '21, Secretary, 87 Passaic Avenue, Summit, N.J.**

Niagara Falls Technology Club

The first meeting of the Club in 1944 was held at the Red Coach Inn, Niagara Falls, N.Y., at 6:30 p.m. on May 3. It was attended by 23 members, and 11 members of the Buffalo Club, headed by their President, J. R. Ryan '31, and their Secretary, T. H. Speller '29, were kind enough to join us.

After an excellent roast-beef dinner Ray Brown '16, our President, opened the meeting by asking Bob MacMullin '19 to lead the group in singing the "Stein Song" and "Take Me Back to Tech," which he did in his inimitable manner. Each member was asked to stand and introduce himself. Mr. Brown then presented our guest speaker, James R. Killian, Jr., '26, Executive Vice-president of the Institute. Mr. Killian gave us a very interesting and up-to-the-minute talk on the war activities at Technology. Naturally, no definite information concerning the actual work could be given, but an indication of its scope was obtained from the tremendous increase in the Institute's staff, laboratories, and expenditures that Mr. Killian did describe. His talk left us with a definite feeling of pride in the importance of M.I.T.'s part in the war effort.

A lively question and answer period followed, and many of the Institute's postwar plans were discussed. Marvine Gorham '93, Honorary Secretary of the Buffalo Club, told us about his activities in interviewing and selecting prospective students for Technology. One of the best meetings in many months then adjourned at 10:00 p.m., as Mr. Killian had to make train connections for Boston. We were all very grateful that he could spare the time to speak at our meeting and hope he will be able to visit us again in the near future. — **WILLIAM H. HOPE, JR., '36, Secretary, Gilman Fanfold Corporation, Niagara Falls, N.Y.**

Technology Club of Rochester

An address by the President of the Alumni Association, Francis J. Chesterman '05, on May 23 completed the spring series of club

programs. He came direct from the May meeting of the Alumni Council in Cambridge and talked to us about the report of the special committee which recommended a permanent executive officer for the Alumni Association. "What the Alumni Mean to the Institute and What the Institute Means to the Alumni" summarized Chesterman's remarks. In an informal discussion he presented some of the opportunities and responsibilities of Alumni during the coming years and discussed the contribution they might make toward the broad purposes of Technology.

One evening in the club schedule, March 25, was devoted to the relaxation of a dinner dance. The gathering in the College Room of the University Club was not so large as a prom or an Interfraternity Conference dance, but was filled with the same Technology spirit. Members attending the meeting on May 23 were: Collin H. Alexander '39, John F. Ancona '03, Abbott Byfield '38, Francis J. Chesterman '05, J. Nelson Cooper '30, M. Herbert Eisenhart '07, Edward S. Farrow '20, M. Wren Gabel '39, Howard S. Gardner '30, Albert S. Knight, Jr., '42, Frederick J. Kolb, Jr., '38, Frank W. Lovejoy '94, Edmund H. Miller '23, William A. Pitbladdo '31, Hugh M. Shirey '22, Harold L. Smith, Jr., '39, Richard G. Talpey '41, Stanley C. Wells '30, and Paul B. Wesson '98. — **FREDERICK J. KOLB, JR., '38, Secretary, Building 14, Kodak Park, Rochester, N.Y.**

Washington Society of the M.I.T.

The Society held its last meeting until the fall season, at the Y.W.C.A., 17th and K Streets, on May 11 at 5:50. The meeting opened with J. W. Gaffney '28 at the piano and Al Bird '30 leading "Take Me Back To Tech." Merton Emerson '04 called for annual reports, the first being a report on the activities for the year by Vice-president Bill MacMahon '22. A. E. Beitzell '28 gave the treasurer's report, showing a considerably increased balance, amounting to \$629.80, and announced our contribution of \$100 to the Alumni Fund in the name of our members in the armed services. Al Hanson '14 reported, as auditor, that the treasurer's books were in A-1 condition. Frank Milliken '04, our capable Secretary, gave a semi-humorous, semiserious report on the problems of his office in collections, meeting notices, reservations, and so forth. He has done an excellent job, and the membership, largely as a consequence, shows a net gain of 83 to 473 active at the present time, practically all paid. The amount of work done and the excellent records that Frank keeps are sincerely appreciated by the Society. Mert Emerson announced the retirement of our Treasurer of many years, C. H. Godbold '98, after 45 years of continuous service in the Navy. Proctor L. Dougherty '97 announced that Mr. Godbold would take up residence on the West Coast in Tarzana, Calif., although he would also keep his residence in Cabin John, Md.

The nominating committee, consisting of Proctor L. Dougherty '97, Chairman, Hewitt Crosby '03, Edward D. Merrill '09, Robert K. Thulman '22, J. Y. Houghton '26, and George D. Mock '28, presented its slate, President Emerson yielding the chair to F. A. Hunnewell '97. The following were nominated and elected officers for the ensu-

ing 12 months: President, William K. MacMahon '22; Vice-president, John Nolen, Jr., '20; Secretary, Frank W. Milliken '04; Assistant Secretary, Albert F. Bird '30; Treasurer, Carroll L. Wilson '32; additional members of the executive committee, Merton L. Emerson '04, Maurice R. Scharff '09, William Thompson Smith '21, H. Howland Fisk '22. The Honorary Secretaries appointed by President Compton who will continue in office consist of Joseph Y. Houghton, Edward D. Merrill, William K. MacMahon, Robert K. Thulman, George D. Mock, Hewitt Crosby.

Mr. Marquis W. Childs, correspondent and author of *Washington Calling*, gave an address on "Following the News of the World," which was one of the most interesting informative talks that we have been privileged to hear. Starting with his experiences last year in Sweden, he held the attention of his audience every moment. To reach Sweden he had had to cross Hitler's electronic fence in a DC3 from Scotland; his was the last plane out and was never heard from on the return; subsequent planes were shot down. He himself had a hairbreadth escape coming back. From personal talks with Swedish and German industrialists, he learned a year ago that the bulk of German industrialists and of the middle class and academic group were sick of the war, in despair, fed up with regimentation, and in great fear of Russia. They realized that Hitler was a madman, and even the youth would not volunteer for the questionable honor of being inducted into his bodyguard organizations. One industrialist, asked why he did not move his family away from Essen to Bavaria, admitted that such a move would result in his immediate loss of factory personnel. As a consequence, his family stayed in a concrete shelter under the garden most of the time. Nazi propaganda, featuring the threats of the allied countries as to postwar treatment of Germans, causes them to fight in desperation. This and the intermittent bombing have allowed them to retain and regain their resolution. Marquis Childs feels that the continuous method now adopted may have better effect. A year ago the bulk of Swedish and German industrialists were predicting that it would be all over in 1943. Mr. Childs told of intimate discussions with Marshall Harris of the Royal Air Force in his great underground headquarters, with opportunities to look into his "juke box" at enlarged photographs showing the bomb damage on the continent. He told of Marshal Harris' worry about lack of sufficient planes in England during the action in Africa, making it impossible for him to carry on the strategic bombing that he had had in mind. It was Childs' feeling that, although the planes are now available, the imminence of the invasion may prevent any conclusive demonstration of what real strategic air bombing can do, and that this may become a much-discussed question for years following the present war, because of the lack of real opportunity for continuous strategic bombing over a long enough period.

A meeting of the executive committee was held on May 22. Frederick M. Moss '32 was elected assistant treasurer, replacing Carroll L. Wilson, who found it impossible to accept the office. Albert F. Bird '30, As-

sistant Secretary, was also elected Review secretary. The following resolution was presented to Major Emerson: "WHEREAS, Major Merton L. Emerson '04 has completed four terms as president of the Washington Society of the M.I.T., during which period it has grown and prospered, and WHEREAS, He has given willingly and untiringly of his time and ability, in spite of some considerable sacrifice entailed by the travel requirements involved in his position with the government, and WHEREAS, He expressed the desire to be relieved of his duties as president, but has accepted election as a member of the executive committee and representative on the Alumni Council at Cambridge; now therefore, be it Resolved, That the executive committee of the Washington Society of the M.I.T. wishes to express for the Society its deep appreciation of the time and effort he has devoted to its welfare, and the hope that he will continue to lend the benefit of his judgment to the affairs of the Society, and to the meetings of its executive committee as its chairman." Major Emerson accepted the election as chairman of the executive committee.

The meeting of May 11 was attended by the following: 1887: G. H. Parks; 1889: G. W. Stone; 1890: J. G. Crane; 1892: B. P. Du Bois; 1897: P. L. Dougherty, F. A. Hunnewell; 1898: Martin Boyle; 1900: E. G. Allen, F. W. Southworth; 1903: H. Crosby, R. Haskell; 1904: M. L. Emerson, A. M. Holcombe, F. W. Milliken, G. H. Shaw, G. N. Wheat; 1905: O. C. Merrill; 1907: E. L. Moreland; 1909: E. D. Merrill, B. A. Robinson; 1911: D. P. Allen, C. P. Kerr, W. H. Martin, A. W. Yereance; 1914: A. E. Hanson; 1918: H. D. Manuelian, E. Rogal; 1919: A. H. Blake, L. J. Grayson; 1920: John Nolen, Jr.; 1921: Richard McKay; 1922: G. R. Hopkins, W. K. MacMahon, C. A. Moore, J. R. Morton, Jr., J. H. Teeter, R. K. Thulman; 1924: C. E. Herrstrom, J. E. Jackson, D. O. Kennedy, G. E. Lamb, W. W. Sturdy, M. N. Waterman; 1925: H. B. Swett; 1926: S. J. Cole; 1927: E. G. Cowen; 1928: A. E. Beitzell, J. W. Gaffney, G. D. Mock, W. H. Phillips; 1929: N. P. Stathis; 1930: A. F. Bird, J. R. Bloom, C. W. Maskell, J. A. Mathews, N. C. Nelson; 1931: M. V. Caputo; 1932: G. A. Lowery, F. M. Moss; 1933: Bess Exton; 1935: H. P. Haley; 1936: G. D. Mylchreest, G. V. Schliestett; 1938: J. W. Steiner; 1942: Z. W. Wilchinsky; staff: R. D. Bennett. — FRANK W. MILLIKEN '04, Secretary, 613 North Greenwich Street, Falls Church, Va. ALBERT F. BIRD '30, Assistant and Review Secretary, 5070 Temple Hills Road, Washington 20, D. C.

CLASS NOTES

1887

At the time of the passing of our classmate, George Sylvester, in January last, very little information was at hand regarding his professional career, and in consequence his obituary, as given in the class notes in the March Review, was necessarily brief. Your Secretary has recently received a copy of the Rockwood Times from which the following article is quoted as a supplement to that already published: "George E. Sylvester, 79, one of the pioneer settlers of Rockwood, died at his home here Monday afternoon,

Jan. 17. He was the last remaining member of the family bearing his name. Mrs. Bessie Stanley Sylvester, his widow, survives him.

"Mr. Sylvester was born in Danvers, Massachusetts, July 14, 1864, and received his literary and technical education at the Massachusetts Institute of Technology in Boston. He came to Rockwood in the eighties and had a leading part in the laying out of many sections of the city. His ability as an engineer was soon discovered and, with Governor White, he surveyed the route for the Tennessee Central Railroad through this section. The lure of the West soon captivated him and after spending some time in Cripple Creek, Colo., he went to Central America and was connected with an English mining company at Salvador.

"In 1903 Mr. Sylvester returned to Rockwood and installed the first water system for this city. He served as State Mining Inspector under Governor Hooper and was later elected president of the National Association of State Mining Inspectors. In 1926, at the instance of the Rockwood Civitan Club, Mr. Sylvester discovered a way by which it was possible for U. S. Highway 70 to pass through Rockwood, although the State Department had previously declared it was unable to survey a practical route. Mr. Sylvester, as a surveyor and engineer, developed this section in many ways which have in later years proved of inestimable value. He did things that many called impossible and lived to see all his work prove to be successful and good. He not only dreamed and visioned of these things but he made them to successfully come true with the resulting betterment of all mankind who followed after him. He was a charter member of the Rockwood Civitan Club and for the past 14 years its secretary, being the oldest secretary of Civitan in the entire International area. He was a Mason, having been presented by the Grand Lodge of Tennessee with a 50-year certificate in 1941. . . ." — NATHANIEL T. VERY, Secretary, 15 Dearborn Street, Salem, Mass.

1888

As you have already learned from our circular letter, we have decided to omit this spring, for the first time in 59 years, our annual class dinner, a custom begun in our freshman year, 1885. This first lapse is due to the unsettled state of transportation and to rationing, which makes it impossible for President Webster to invite us to his home, as he has done for the last 15 years; but we have an invitation to meet there and dine with him as soon as circumstances will permit.

Your Secretary recently wrote George W. Hamblet of Lawrence, Mass., regarding two classmates from whom we have not heard for over 50 years and has today received his reply, as follows: "Granville Allen has been a practicing physician here for many years. His home is at 3 State Street, Lawrence. I never realized before that Allen was with '88. Ed Gould was in the junk business in this city for many years with the firm of Gutterson and Gould. A few years ago he sold out his interest to Gutterson and went to Texas and is now with some salt company at Fort Worth. I am still plugging away at the same old stand in the foundry and machine work that I have always liked. The Class surely missed you at the last reunion and hopes you will

be at the next one. When gas becomes more plentiful, I hope to get down your way and go out to Chebeague."

C. Leonard Brown of 41 Day Street, Somerville, civil engineer, died at his home on April 30. He was born in Stoughton, Mass., and after leaving Technology was in succession with the Union Pacific Railway in Colorado and the Minnesota Iron Company in Minnesota; he was mining engineer in Aspen and Pitkin, Colo., and engineer with the Massachusetts Highway Commission and the Boston Transit Commission. In July, 1917, he went to Washington, D.C., as senior highway engineer and held that position for 27 years until his retirement seven years ago. He was a member of the Boston Society of Civil Engineers, American Association of Engineers, and the Massachusetts Society of Washington, D.C. The services were attended by Assistant Secretary Sanford E. Thompson and Fred Ellis. Flowers were sent from the Class by our floral secretary, John Runkle. — Ellis called on Eastman at his home in Westford and reported him as "wearing his usual Santa Claus smile." — BERTRAND R. T. COLLINS, Secretary, Chebeague Island, Maine. SANFORD E. THOMPSON, Assistant Secretary, The Thompson and Lichten Company, Inc., 620 Newbury Street, Boston 15, Mass.

1890

Our Secretary has just returned from his trip to Mexico, where, he says, traveling is anything but comfortable. He could undoubtedly report some very interesting experiences. — Since the last class notes were reported, notice has been received of the passing of two more of our classmaes.

Elton David Walker died on February 24 at his home in State College, Pa. Charles Sherman kindly sent us a copy of a memorial prepared by his colleague, Professor Leland S. Rhodes at Pennsylvania State College, for the American Society of Civil Engineers, which gives the following facts pertaining to Walker's distinguished career. Upon receiving his degree he returned to M.I.T. for a year as assistant in the Civil Engineering Department; afterward he engaged in professional practice for several years in the engineering firm of Walker and Gallagher in Chicago. In 1894 he returned to an academic career at Union College, Schenectady, and in 1900 was called to the faculty of Pennsylvania State College, where, at the time of his retirement as professor emeritus in 1939, he had held the position as head of the department of civil engineering for 33 years. Along with his academic duties Professor Walker carried on an extensive consulting practice until about two years before his death, principally in the fields of sanitary engineering and public health, to which he contributed much in valuable research. During World War I Walker served in France as captain of the 15th Engineers, United States Army, and received from General Pershing a citation "for exceptionally meritorious and conspicuous services with the 15th Railway Engineers at Jonchery and Liffol-le-Grand." After the war he continued in the Army Reserve Corps and became a colonel of Engineers, maintaining active participation in the work of the corps until 1942. He was president of the Centre County chapter of the Reserve Officers Association of the United States, and later first vice-

1890 Continued

president of the Pennsylvania department of that organization. Walker was a member of the following professional societies: the American Society of Civil Engineers, the New England Water Works Association, the Society for the Promotion of Engineering Education, and the Society of American Military Engineers; he was a fellow of the American Public Health Association. He also held membership in the honor societies of Sigma Xi, Phi Kappa Phi, Tau Beta Pi, Chi Epsilon, and Scabbard and Blade, and in the Delta Kappa Epsilon social fraternity. He was an active member of St. Andrews Episcopal Church of State College, being for a long time a member of its vestry. A very loyal member of our Class, he attended our reunions whenever possible. While at Union College in 1896 Professor Walker married M. Louise Brownell of Schenectady. Two children born to them are now deceased. He is survived by Mrs. Walker, of State College, and by a brother, Chester E. Walker, of Taunton, Mass.

Thomas J. Sturtevant died on April 20 at his home in Wellesley Farms, Mass. After receiving his bachelor's degree in Electrical Engineering he entered at once the Sturtevant Mills, of which his uncle was then the head. His entire engineering career was devoted to the work and development of this plant, of which he was president at the time of his death. The burden of the many problems connected with the defense work in progress at the mills weighed heavily upon him during the last years of his life. He is survived by two sisters, Miss Grace Sturtevant of Wellesley, and Mrs. Hattie Everit of Groton, and by a brother, Robert S. Sturtevant of Nashville, Tenn. — GEORGE A. PACKARD, *Secretary*, 50 Congress Street, Boston 9, Mass. HARRY M. GOODWIN, *Assistant Secretary*, Room 4-242, M.I.T., Cambridge 39, Mass.

1891

Margaret E. Maltby, who was graduated with our Class, died on May 3 in New York. As one of the small number of coeds on our roster, we sent her reunion notices and such and through the years received letters from her showing her continued interest in the Institute, some of which we have used for Review notes. The following account is taken from the *New York Times*: "Dr. Margaret E. Maltby, a retired Associate Professor of Physics at Barnard College, died Wednesday evening in the Harkness Pavilion, Columbia-Presbyterian Medical Center, at the age of 83."

"Born in Bristolville, Ohio, Dr. Maltby was graduated in 1882 from Oberlin College and nine years later received a Master of Arts degree there. She was an instructor in physics at Wellesley College from 1889 to 1893. After receiving a Bachelor of Science degree from the Massachusetts Institute of Technology, she went to Germany, on a traveling fellowship, and worked for several years under the direction of Prof. Friedrich Kohlrausch, a leader in physical chemistry. The University of Goettingen awarded to Dr. Maltby a doctorate in 1895, and soon afterward she returned to this country. In 1897 she was an instructor in physics and mathematics at Lake Erie College, and the next year she returned to Germany to become assistant to the president of the Physikalsche Technische Reichsanstalt in Berlin.

"Dr. Maltby joined the faculty of Barnard in 1900 and for three years was an instructor in chemistry. In 1903 she became Adjunct Professor of Physics and seven years later associate professor, serving until she retired in 1931. Before her retirement Dr. Maltby introduced a course in the physics department designed for music students and dealing with the physical basis of music, believed to have been the first such course."

For many years she was a member of the board of awards of the American Association of University Women, an office which required considerable world travel. She was also charged with selecting young women for graduate work in the sciences. Later, the association named its fellowship for graduate work in science the Margaret E. Maltby Fellowship, in recognition of her work for serious women scholars. Her nearest survivor is a nephew, Major Phillip R. Meyer, of the Army Air Forces, stationed at Brookley Field, Mobile, Ala. — HENRY A. FISKE, *Secretary*, Grinnell Company, Inc., 260 West Exchange Street, Providence, R.I.

1894

The great event of the year for '94, our 50th reunion, will be a matter of history before these notes appear in print. For the benefit of those who cannot attend the reunion a report will be prepared for the first issue in the autumn. It may now be stated that many letters have been received by the Secretary expressing the great regret that sharing in the reunion is impossible because of a great variety of conditions, chiefly the difficulties and limitations imposed by the war situation. There has never been a more cordial response or so much evidence of the deep feeling of members of the Class for the Class itself and for the Institute.

As a special feature of this 50-year celebration, it has been decided to attempt to make the class contribution to the Alumni Fund as generous as possible. This plan has received the hearty commendation of President Compton and is regarded as more practicable than to install any memorial which we purchase for the Institute. We hope to establish a precedent for future 50-year classes to follow if they so desire. We also hope to increase our quotas, both of number of contributors and amount contributed, to establish a record for others to follow.

Two deaths of classmates have occurred during the period in which we have been planning our class festivities. Nathan B. Day, after having sent in his notice of intention to attend the reunion, died suddenly of a heart attack while at the Union Club in Boston on April 26, and notice was received a few days later of the death of Frederick P. Simonds at Mamaroneck, N.Y., on April 19. Mention of their activities will be made in the next issue of class notes. — SAMUEL C. PRESCOTT, *Secretary*, Room 3-233, M.I.T., Cambridge 39, Mass.

1896

The latest honor to Will Coolidge was the bestowal of the Franklin Medal at the annual Medal Day ceremonies held at the Franklin Institute in Philadelphia on April 19 with the citation, "In recognition of his scientific discoveries which have profoundly affected the welfare of humanity, especially

in the field of the manufacture of ductile tungsten and in the field of improved apparatus for the production and control of X rays." Among the many scientific awards coming to him, Dr. Coolidge had previously received the Howard N. Potts and the Louis Edward Levy medals of the Franklin Institute. The Franklin Medal was founded in 1914, and it has been awarded to very high-ranking scientists. It was awarded to Willis R. Whitney '90 in 1931, and in 1925 to Elihu Thomson of our M.I.T. Corporation.

Spring seems to have arrived up in the Nova Scotia district, and with it has come a letter from Henry Waterman accompanied by a clipping from the local Yarmouth paper. He referred particularly to the passing of Buster Crosby and the very pleasant recollections he had of him as a classmate who was the first to complete an examination and stalk out of the room with a happy smile on his face. Henry is looking forward to being with us in 1946 for our 50th anniversary. A recent honor which has come to him was that of being made president of the Yarmouth Hospital board, an organization with which he has been connected officially for several years.

Lloyd Wayne in Indianapolis is another man who has burst forth with the coming of spring, although his letter did not give much in the way of news. He has seen Billy Andrew occasionally, and he reports that Billy is looking fine and is perfectly healthy and on his toes, keeping busy as a commuter on business between Cincinnati and Washington. Wayne fails to see much of Stickney very often in Indianapolis, but says that Joe is now serving his 13th consecutive term as president of the Indianapolis Athletic Club and continues to operate his very successful insurance business. Wayne has recently taken on the job of cooperating with Tom Harvey '28 for the reactivation of the Indiana Association of the M.I.T. Wayne has become temporarily the acting secretary of that organization.

Walter Stearns has written from Schenectady that his winter in Florida with Mrs. Stearns was wonderful and that the weather was exceptionally good to them, giving them seven weeks of continuous sunshine out of the eight weeks that they were there. He played a little golf, a lot of bridge, and turned down absolutely no invitations to cocktail parties to which he was fortunate enough to be invited. Their return trip north was not so pleasant because of travel difficulties and a succession of cold and rainy days. There was a stop-off in Raleigh, N.C., and another one in New York. An unpleasant event of the northern trip was that when he boarded the train at Murdock, Fla., for Southern Pines he found the drawing room for which he had tickets already occupied. The agent had sold the space twice, and since the other people who had got on previously at Bocagrande were in possession, there was nothing for Walter to do but be as happy as he could in an upper berth, which was the only thing left on the train. His stay in Raleigh for treatment of arthritis was longer than he had intended, and consequently he was not able to visit Arthur Baldwin in Charlottesville.

Your Secretary, in his official capacity as Alumni Secretary, paid a visit on May 2 to

1896 Continued

the Technology Club of New Bedford where he was regaled with a wonderful dinner, but where the evening failed to be 100 per cent perfect because his expectation of seeing Dave Beaman there was not realized. The report given was that Dave was out of town at that time, but there was no statement as to where or why.

Steve Crane, who has been on the retired list of the Telephone Company for some time and living in New Jersey, has moved to sunny California to continue his retirement at 140 South Los Robles Avenue, Pasadena 5. — A note from Le Baron Russell gives his new address as Old Sudbury Road, Wayland, Mass., and Jim Melluish reports that he is now with the New York State Department of Health at 35 Market Street, Poughkeepsie, N.Y.

Saturday morning, April 29, loomed cool and drear and bade fair to be just another of those April days which this year seem to have borne out the New England tradition of winter lingering in the lap of spring. Then in the middle of the forenoon the Secretary's telephone rang, and suddenly all was changed. The sun seemed to shine brighter. The atmosphere became warmer with the distinct breath from the South in the air. The forsythia buds fairly leaped into blossom, and all the world sang for joy. It was Arthur Baldwin's voice bringing into New England all of the warmth and good cheer from old Virginia and telling that he was again in Boston and eager to have a luncheon of the famous Parker House tripe. Naturally the Secretary was most happy to join him, and he learned that this was one of Arthur's periodical trips north to see his son and family in Boston. He had left Mrs. Baldwin in New York City. There was not much in the way of news, except that Arthur was continuing the operation of his ranchette and orchard. He did have a definite ambition to solve the problem of handling his lawn, which is fully an acre in size. To keep this mown with a hand lawn mower is some job, and Arthur is seeking a mower that cuts a wide swath and is driven by an internal combustion engine, preferably with a seat on which Arthur can ride and mow with maximum ease. If anyone should know of such a lawn mower being available, either new or secondhand, he will confer a favor on Arthur by writing to him at Braemore, Farmington, Route 3, Charlottesville, Va.

Con Young wrote early in May that he was still in the South because of difficulty in getting transportation back North to Cape Cod. His story was somewhat similar to that of Walter Stearns, although since he had not started at the time he wrote, he did not have any tale of finding his space already occupied. He did say that in order to get reservations one was obliged to stand up or sit up all night on a camp stool at the railway ticket office. Because of a series of bronchial colds in early spring he did not feel equal to an all-night vigil in the damp night air and he was not inclined to deal with scalpers, so that he was not scheduled to leave St. Petersburg until May 21. Although no further word came from him, the expectation is that he and Abby arrived back North safely to spend the summer, and possibly even next winter, at Bass River on Cape Cod. During the winter in Florida

Con resumed his singing and appeared on Kiwanis programs, and he received offers of engagements in church choirs.

Admiral Bakenshus has sent a copy of the *Proceedings* of the annual meeting of the American Institute of Consulting Engineers at which he presided and gave the presidential address preceding the guest speaker. On Tech Night at the Pops in Symphony Hall, Boston, on June 3, a quartet of '96 occupied one table — Grush, Locke, Rockwell, and Rundlet.

Our classmate, William H. Thomas, passed away after a brief illness in Westfield, N.J., on March 31. He and Mrs. Thomas have been running St. Christopher's School there for young people. He had not been in the best of health for some time, but they had been contemplating a trip to Boston during the coming summer. In addition to his widow he leaves two sons — David, an aerial gunner on a Flying Fortress in the Army Air Forces, and John, an ensign in the Navy. The following tribute has been received from his widow: "Perhaps the greatest endowment an alma mater can give is the continuing thirst for knowledge, the steady abundant growth of a well-trained mind, the increasing ability to live with and for others, as long as a spark of physical life remains. Just so did W. H. Thomas, M.I.T. '96, carry on his class tradition. Working as a chemist in a Magog, Quebec, printworks, right after graduation, he studied and grew. Following on in Montreal, he made hobbies of music and photography. During his years as chemist in printworks in New England and New Jersey he gave many an assistant a new slant on life's meaning and opportunities. As manager of a works making textile oils, he was the friend and consultant of his men. But perhaps the last 12 years of his life, when he worked with about 70 or 80 boys and girls in his own school, were of the greatest service. The children learned from him a deep reverence for their Creator and a craving for truth, more and more truth. Under his guidance many a timid soul, many a heedless 'quitter' came to believe in himself, and do great things." The April issue of *Education Foundations*, which is the publication of St. Christopher's School, is a memorial number for Thomas, giving an account of the memorial service in the Congregational Church on April 2 and also containing Mrs. Thomas's thoughts for the future.

From Mrs. Marble, and also from Irv Merrell, has come the information that Louis C. Marble passed away on May 7, at a hospital in Cleveland, Ohio. Irv says that some five years ago Lou had a very serious illness and that since then he had had to be around the house most of the time. He had been feeling badly for a couple of weeks, but had been in the hospital only five days. Interment was in the Marble family lot in the cemetery at Marcelus, N.Y. According to Irv, Marble was first employed in railroad work in Massachusetts, and then he went to Cleveland to do civil engineering work for an interurban trolley line. After that he was in the employ of the Link-Belt Company, first in the engineering department, and then in the sales department. In later years he was a manufacturer's agent, making sales of certain specialties. After his breakdown in health he spent much time at a bench do-

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ing something with his hands to pass the time, and one of Irv's treasures is a fine tackle box which Lou, knowing how well Irv liked to fish, made for him. Irv says further that Lou was a great lover of the outdoors and knew every bird there was in the places he had been. — CHARLES E. LOCKE, Secretary, Room 8-109, M.I.T., Cambridge 39, Mass. JOHN A. ROCKWELL, Assistant Secretary, 24 Garden Street, Cambridge 38, Mass.

1898

We note in *Science* of December 10, 1943, that C.-E. A. Winslow gave the presentation address at the award of the Sedgwick Memorial Medal of the American Public Health Association to Brigadier General James Stevens Simmons. We also note that Winslow himself was the recipient of this medal the preceding year.

The Secretary and Mrs. Blanchard spent the winter in Bradenton, Fla., but not having a car there, did not get over to Babson Park to see Roger Babson. The Florida newspapers, nevertheless, had plenty to say about Roger's doings and opinions, and his syndicated articles were given due prominence.

The news bureau of the General Electric Company furnishes us the following: "Ray Clinton Faught, long associated with General Electric's Baltimore office as a sales engineer, has retired after 45 years and 7 months of service with the company. Born in Sidney, Me., in 1875, Mr. Faught attended Coburn Classical Institute in Maine and was graduated from the Massachusetts Institute of Technology in 1898 with the degree of bachelor of science in Electrical Engineering. Upon graduation, he was employed by General Electric as test man at West Lynn and in 1900 was transferred to the Philadelphia office as specialist on arc lamp sales. In 1902 he went to Richmond, Va., on general supply sales and a year later was transferred to the Baltimore office. In charge of the Washington office during World War I, Mr. Faught returned, in 1919, to the job in the Baltimore office which he held until the date of his retirement. Mr. Faught took a very active part in the Maryland section of the American Institute of Electrical Engineers and the Engineers Club of Baltimore; serving on the executive committee and other committees of both societies."

In the *Aeronautical Engineering News* for March there is a long account of the twelfth annual meeting and honors' night dinner of the Institute of the Aeronautical Sciences, at which tribute was paid to Lester Gardner. It will be recalled that he conceived and organized this institute and through his energy brought it to its present high repute, and that it was for these accomplishments that he was awarded the honorary degree of doctor of laws from the Polytechnic Institute of Brooklyn in 1943.

Sam Chapin handed us a publicity booklet of Foreign Trade Zone No. 1 of the port of New York. Since the establishment of this enterprise was due in part to the efforts of Colonel Robert Starr Allyn, deputy commissioner of docks of New York City, and since he has had charge of the operation of this trade zone since February, 1937, we may well list this as one of the achievements of the Class. Although free ports

1898 Continued

have existed in Europe for many years, this is apparently the first of its kind in the United States. The zone consists of a sizable tract on the water front of Staten Island which can be thoroughly isolated, but has good rail connection. Into this zone, or free port, goods may be brought without paying import duties. Here they may be stored or processed, reshipped to other countries or entered through the United States customs on the basis of the weight after the storing or processing. Such a free port is an enormous inducement to world commerce to come to our shores, and also it greatly promotes our friendly relations with South America. This is the first experiment of its kind in this country, and it is operating successfully in spite of much opposition from local warehousemen and hindrances of all kinds from those whose interests were touched. Its success is expected to lead to the establishment of similar foreign trade zones in our large seaports.

On May 24 Ernest Russ and the Secretary and a few others went to Ed Chapin's apartment to see George Cottle show his latest pictures. It should be remembered that George is running a factory turning out huge quantities of small parts vital in the mechanism of many war machines. He had been working 16 hours a day for over two years and needed a change. With the usual energy characteristic of both his work and his vacations he started for Guatemala early in January. This little country, notable alike for its model government and its ideal climate (a high plateau), is a travelers' paradise. He spent a few weeks there and on the way home stopped at Mexico City and visited the remarkable new volcano. His kodachrome movies were up to his own high standard, and particularly impressive were his pictures of the volcano. This cone, 2,500 feet high, which spouted out of a peaceful cornfield about a year ago, with the smoke and ashes rising to a height of several miles, made a fearsome sight. Since returning George has taken on several new contracts and is again up to his neck in work.

Ernest Russ and Ed Chapin are both well and very busy in their respective lines of industry. Ernest reported that he had seen Harold Jones recently when he visited his sister in Boston. Jones is still head of the huge Army Medical Library in Washington. Ernest had also heard recently from Howard Bodwell. It will be remembered that Howard retired from the steel business a few years ago and has gone to southern California to relax. He is now back in Pittsburgh, again active at his old work and thus contributing to the war effort.

Howard B. Collins' address (formerly Monticello, Utah) is now Post-office Box 483, Uravan, Colo.; and Albert W. Tucker's (formerly Raleigh, N.C.) is 1223 Ruger Place, Daytona Beach, Fla.—News of the death of the following classmates has reached us: Henry D. Osgood of Stephentown, N.Y., in January, 1944; Donald C. Campbell of Spokane, Wash., on September 24, 1942; and Thomas M. Roberts, Washington, D.C., on January 10, 1944.

We clip the following from the Washington Post of January 13. . . . Thomas M. Roberts, retired electrical engineer of the supervising architect's office of the

Treasury Department, . . . died [January 10] at his home, 3037 Dent pl. nw., after a brief illness. Born in The Dalles, Ore., Mr. Roberts was graduated in 1893 from the University of Oregon and in 1898 from the Massachusetts Institute of Technology with a degree in electrical engineering. He was employed by engineering firms including the General Electric Co. and the Edison Storage Battery Co. prior to becoming in 1917 associate engineer in the Bureau of Yards and Docks of the Navy Department. In 1926 he was transferred to the Treasury Department where he was employed until his retirement in 1937. A member of All Soul's Unitarian Church, he was active in its Layman's League and was superintendent of the church school from 1920 to 1923. He was a life member of the American Institute of Electrical Engineers. He is survived by his wife, Mrs. Violet Kent Roberts, and by two sisters, Mrs. George R. Stephenson and Mrs. Ralph Davies, both of Oregon." —ARTHUR A. BLANCHARD, Secretary, Room 6-421, M.I.T., Cambridge 39, Mass.

1900

An interesting interview with Marcy L. Sperry was published by Eileen Etten in her "Did You Happen to See" column in the Washington *Times-Herald* recently as follows: "He has the stern deliberate look of a man who's far too concerned with the serious things in life to look approvingly upon any nonsense around him. When you meet him he's engrossed with some business matters of the Washington Gas Light Company, of which he's president. He looks at you quizzically from behind his pince nez reminding you somewhat of a high school principal about to severely lecture a wayward student. Then Marcy L. Sperry begins to talk, and you catch that glint of humor in his eyes as he says jokingly, 'If I have as much fun in the next 50 years as I've had in the past 75, I'll be perfectly happy.' You realize he's a man who actually has had a wonderful time in life and who always has time for a little joke and a little laughter no matter how busy he may be. 'I lived quite a few places, and held quite a few jobs before coming to Washington in 1932. Bit of wanderlust blood in my veins, I expect. My dad was a Regular Navy man, you know,' he says. His father was the late Rear Admiral Charles S. Sperry, who commanded the Atlantic Fleet on a round-the-world cruise in 1908. Recently one of Marcy's five children, a daughter, christened a destroyer, naming it after the admiral. Born in Annapolis, Marcy attended school in Paris, France, Force School and Central High School here, and was graduated from the Massachusetts Institute of Technology. He started work in a machine shop in Philadelphia, then went into public utilities business. He worked in Georgia, Ponce, Puerto Rico; in Minneapolis, in Boston and the West Indies. 'Once I got a job cleaned up, I liked to try something else,' he declares. Sperry is a tennis player. He's chairman of the Utilities section of the Payroll Savings Division of the D.C. War Finance Committee, and vice warden of the Orphans' Association of St. John's Parish, where he's a vestryman." —C. BURTON COTTING, Secretary, 111 Devonshire Street, Boston 9, Mass.

1901

Since reporting the death of Frederick Clapp in a recent issue of these notes, I have received from the Alumni Association the following article concerning him, written by Wallace E. Pratt, and published in the May, 1944, number of *Mining and Metallurgy*: "Frederick Gardner Clapp, consulting geologist, of 50 Church St., New York, a member of the A.I.M.E. since 1910, died suddenly while on professional work at Chickasha, Okla., Feb. 18, 1944.

"Frederick Clapp had been an outstanding figure in petroleum geology for more than a generation. His was the distinction of having established in 1908 the first permanent consultation service in the field of oil and gas geology. His success was immediate and far-reaching; within a few years his prestige grew to international stature and thereafter his professional activity continued to draw him from one place to another over the earth's surface up to the very end of his long career.

"In his native Boston, Clapp studied at M.I.T., where after graduation in 1901 he continued for two years as a member of the faculty. In 1908, at the end of six years on the staff of the U. S. Geological Survey, he established a private practice as a consulting geologist in New York. In his professional capacity his early work included official assignments from the U. S. Bureau of Mines, the U. S. Senate, and the Canadian Department of Mines. He repeatedly served as petroleum adviser to the Imperial Government of Iran and only recently returned from a long tour of service as a consulting expert on petroleum with the Turkish Government. His geological explorations kept him for three years in China and took him also to Australia, New Zealand, Egypt, Palestine, France, Afghanistan, and the West Indies for extended periods of investigation. Yet he found time to serve as lecturer on oil geology on the faculty of Harvard in 1921 and at all times he maintained wide professional practice in Texas, Oklahoma, and practically all of the oil-producing states in his own country.

"A prolific and scholarly writer, Clapp is the author of well over a hundred publications on oil, gas, underground water, general and economic geology, geography, and archaeology. A complete bibliography of his works appears in the current volume of the *Bulletin* of the American Association of Petroleum Geologists. In addition to his publications, he gave of his time and interest as a fellow of five national scientific societies and as a member of nearly a score of professional societies. . . .

"Frederick Clapp was a citizen of the world. His life work contributes significantly to the cause of internationalism. We have recognized values in relationships; the debt science owes industry; the debt industry owes science; but in the international theatre, governments stand deeply beholden to the Frederick Clapps of the world. If we look upon government as a social contract in the common interest, then the great void in world government can best be spanned by the friendly, helpful ministrations of the small, roving group of scientists in industry, among whom this man took his place.

1901 Continued

"His was an intense, serious-minded nature, straightforward, direct, and forceful, totally devoid of guile. Among his friends he inspired an affectionate esteem. An associate of his on his three-year survey of the oil resources of China says of him: . . . one of the finest characters I have known. I recall especially his industry, energy, vitality. No matter how exhausting the day, how primitive the surroundings, the end of the evening was invariably devoted to a reading in Christian Science and the mastery of at least three more words for his Chinese vocabulary. I still marvel at his accomplishment. Wherever he went, all over the world, he managed to carry along in a single brief case and bag a comprehensive geological library. He was proficient on the typewriter and however isolated his camp a stream of letters flowed out from him continuously. . . . Few men have influenced my life more profoundly." — GUY C. PETERSON, Secretary, 788 Riverside Drive, New York 32, N.Y. THEODORE H. TAFT, Assistant Secretary, Room 3-266, M.I.T., Cambridge 39, Mass.

1904

On April 18, Harry Rollins wrote me from La Jolla, Calif., recalling that this is our 40th anniversary year and regretting that he would not be in the East at the time our reunions have usually been held. He stated that he would be in Boston, however, on May 8 and asked me to have lunch with him on that date and to bring as many classmates as I could round up. So on May 8 Harry gave a lunch at the Engineers Club at which the fateful number of thirteen were present, and to date no ill effects due to that supposedly unlucky number have been reported. From every angle the event was a great success, and all present were very appreciative of Harry's 40th anniversary luncheon. Those present were Gene Russell, Stevens, Parker, Ferris, Fellows, Sutton, Jack Draper, Rockwood, Mert Emerson, Read, Thurlow, and Frank Farnham '03.

A letter from Austin Y. Hoy, who lived in England for many years, gives his new address as Trailing Rock Farm, Hyde Lane, Southport, Conn. — I have received notice of the death of Arthur H. Eaton, II, which occurred on February 22. — Our class agent, Gene Russell, has recently sent out a letter in behalf of the Alumni Fund. He tells me that we are doing a little better than last year, but that considerable more improvement is necessary before we equal the percentages reached by classes near our age. If you have not done anything about it yet, take this as a reminder and do it now. And a pleasant vacation to you all. — HENRY W. STEVENS, Secretary, 12 Garrison Street, Chestnut Hill 16, Mass. AMASA W. HOLCOMBE, Assistant Secretary, Apartment 403, 3024 Tilden Street, Northwest, Washington, D.C.

1905

A memoir of the American Society of Civil Engineers thus memorializes Albert W. Walker, XI, whose death has been previously reported: "Albert Willard Walker was born at Marlboro, Mass., on March 17, 1882, the son of Joseph and Francena (Woods) Walker, and reared on a farm in the vicinity. He attended grade

and high school for the normal periods, and was graduated from the Massachusetts Institute of Technology in Boston in 1905, with the degree of Bachelor of Science in Sanitary Engineering. During intermittent periods from 1899 to 1904, he was with the Metropolitan Water and Sewage Board of Boston, as rodman and instrumentman. On June 7, 1905, through civil service examination, Mr. Walker entered the service of the Bureau of Reclamation as an engineering aide. He was employed continuously in that branch of the federal service until his death at Great Falls, Mont. He was first assigned to the Belle Fourche Project in South Dakota, where he soon was placed in charge of surveys and estimates and also served as inspector on the construction of the Belle Fourche Dam — an earth-fill structure built by contract at a cost of \$1,250,000. Upon completion of this work he was resident engineer in charge of location and construction of many parts of the irrigation system of this project. Transferred to the Milk River Project in Montana, in June, 1912, Mr. Walker was assistant engineer on the construction of the headquarters office building at Malta, Mont., and on the design of Dodson North Canal structures. In July, 1913, he was transferred to the Huntley Project in Montana, as engineer in charge of investigations, design, and construction by government forces of an extensive drainage system consisting mainly of deep tile drains, costing about \$500,000. Thus he entered a field in which much of his future life was to be spent and in which ultimately he excelled by virtue of his understanding of soils and the people who work soils.

"On March 14, 1916, he was transferred to the Grand Valley Project, Grand Junction, Colo. From that date until January, 1917, he conducted the investigations and prepared the plans for the drainage of the Grand Valley Drainage District — a co-operative project with an estimated cost of \$1,500,000. Thereafter he conducted a similar investigation and made plans, prepared specifications, and supervised the construction of the drainage system for the Grand Valley Project. This program cost about \$300,000. From August, 1921, until February, 1925, Mr. Walker was employed principally on the Newlands Project in Nevada, as engineer in charge of all phases of a \$700,000 drainage program involving deep open drain construction with heavy dragline equipment. He was also engaged at odd times as consultant on drainage for other reclamation projects and on special investigations in the San Luis Valley in Colorado. During the remainder of 1925 he was special assistant on soil and drainage matters to reclamation adjustment boards examining the Minidoka, King Hill, Boise, Klamath, and Newlands projects. When this work was completed, he returned to the Newlands Project to work on a small drainage program and to make the investigations, plans, and estimates for the Spanish Fork extension of the project superintendent in December, 1926, retaining this position until May, 1929. During this latter period he directed further drainage work costing \$250,000, and the \$150,000 Truckee Canal reconstruction, and made a series of investigations for reservoir sites in the Truckee River Basin. He

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was transferred in May, 1929, to the position of construction engineer on the Sun River Project, Montana, and in December of that year also assumed the duties of superintendent. Operation and maintenance of much of this project were transferred to the Greenfields Irrigation District in 1931 and under a co-operative arrangement with the Bureau of Reclamation, Mr. Walker also served as manager of the district. He retained both positions until his death. During this period the project was extended from 56,000 to 99,000 irrigable acres, the principal existing canals and reservoirs were enlarged and improved, and drainage work was performed as necessary and possible — all at a total cost of about \$2,500,000. As the canal system was extended to large areas of virgin land, qualified farm families were selected under his direction and permitted to establish homestead residences on the land. The project grew from 400 to 1,050 farms; and its population, from 1,400 to 3,700 persons. To be known as a guiding hand in such growth is much.

"Although diligently devoted to the important official tasks with which he was entrusted, Mr. Walker at all times maintained a participating interest in the civic and social activities of the community. His sound judgment and solution of the perplexing problems of his fellow men were respected and accepted by the many who turned to him for advice. He was a man of simple tastes, exercising extreme patience and a calm demeanor under the most trying situations. To those in the Bureau of Reclamation who knew him, and to the people of the community in which he resided, he was a person rich in character. That character obviously had its beginnings in the habits of sobriety, thrift, and industry necessary to a New England farm home and in the simplicity, honesty, and directness of approach existing in a solid rural community. His life was a beautiful demonstration of the application of such a character without change to a professional career in the public service. For it his associates admired and loved him. He was married on December 2, 1908, at Belle Fourche, South Dakota, to Grace Eva Wilkinson, who died on December 8, 1926. Three children of that marriage, Russell W., Leland J., and Katherine M. (Mrs. L. R. Jourdonnais) survive him. On September 5, 1932, he was married at Seattle, Wash., to Esther McArdle, who also survives him. Mr. Walker was a member of Fairfield Montana Lodge No. 127 A.F. and A.M. and a charter member and first president of the Fairfield Lions Club. Mr. Walker was elected an Associate Member of the American Society of Civil Engineers on May 3, 1910. He died on June 15, 1943." — FRED W. GOLDFTHWAIT, Secretary, 274 Franklin Street, Boston 10, Mass. SIDNEY T. STRICKLAND, Assistant Secretary, 71 Newbury Street, Boston 16, Mass.

1906

Many classmates will remember C. G. Loring, a Harvard A.B. who received his S.B. in Architecture with our Class. Loring called on the Secretary one day in April to say that he was resuming his practice after serving a year and a half in the Massachusetts Civilian Defense organization.

1906 Continued

It is another case of history repeating itself, for Loring has already served as an officer in World War I and returned to his architect's practice in Boston upon leaving the service after that conflict.

May 26 was observed as the seventh annual "research day" in Boston. Herbert Ball, II, a professor of textile engineering at the Lowell Textile Institute, was listed among those taking part in the afternoon conference which discussed "Textiles Today and Tomorrow." — Carroll A. Farwell, I, who is one of the partners in the engineering consulting concern of Fay, Spofford and Thorndike, Boston, is serving as treasurer of the Engineering Societies of New England.

The Hartford *Times* of December 16 included the following notice about P. B. Stanley, II: "Philip B. Stanley was elected President of the New Britain General Hospital at the annual meeting. The new president is a director and past president of the Newington Home for Crippled Children; vice-president of Stanley Securities Company; a director of Stanley Works, the New Britain Machine Company; the Connecticut Mutual Life Insurance Company; the Phoenix Insurance Company; and the New Britain Trust Company." — Another item from the Hartford *Times* of March 16 stated that Colonel R. R. Patch had been the principal speaker at the presentation of the Army-Navy "E" award to the Hartford Red Cross Blood Donor Center on March 13 at the Hartford Public High School. The notice also included the information that Colonel Patch was commissioned in the Reserve Corps in 1923 and has been on active duty at the Office of the Surgeon General since December, 1942.

The following comes from Professor Locke: "A letter from your classmate R. S. Clark, XIII, says that while his recent activities reflect little glamour or renown, they have been of some significance in war production. He serves on the engineering force of the Yuba Manufacturing Company of San Francisco, a company which has a contract with the Ordnance Department. The evidence of the high grade of its product is given by the award of the Army-Navy 'E' and the official statement that the output was fully equal to the best product of the United States arsenals."

It is hoped that classmates, whether statistically-minded or not, will give some attention to the fourth annual report of the Alumni Fund, which has been distributed lately. Comparison of the 1906 performance with that of the other classes shows that there is an opportunity for improvement. All credit to those who contributed, but our 64 per cent looks rather low compared with '05's 71 and '07's 90.

The Secretary regrets having to include notices of the death of four of our classmates. Sidney L. Davis, XI, died by his own hand in Waterbury, Conn., on March 29. After graduation, Davis was employed for a time as consultant engineer during construction of the Panama Canal and had worked in various parts of the country on engineering projects until 1925 when he came to Keene, N. H., as receiver of a bankrupt firm. He had lived in Keene ever since and was a resident of Keene at the time of his death.

George C. Furness, VIII, died at his home in New York City on April 10. The following notice is taken from the *Herald Tribune* of April 11: "George C. Furness, a chemical engineer in the new products division of the National Carbon Company, Inc., 30 East Forty-second Street, died yesterday at the Harkness Pavilion, 180 Fort Washington Avenue. He was sixty years old and lived at 155 East Forty-seventh Street. Mr. Furness joined the metallurgical division of the Union Carbide and Carbon Corporation at Niagara Falls soon after he was graduated from the Massachusetts Institute of Technology in 1906. He held several technical positions there before coming to New York in 1913 and joining the company's Eveready division. As radio manager of the Eveready Hour program, which first went on the air on July 26, 1923, Mr. Furness was a pioneer in commercial broadcasting. The Eveready Hour, the first sponsored program to use a network, set many precedents in radio which are still being followed. Mr. Furness was a member of the New York Entomological Society. Surviving are his wife, Mrs. Margaret Rogers Furness, and a daughter, Betty Furness, stage, screen and radio actress."

Frederick E. MacMillan died on September 8, 1943. MacMillan was a special student. The 1940 "Register of Former Students" shows him as headmaster, Townsend Hall School, Upland, Pa. At the time of his death he was living in Philadelphia which, according to the Secretary's record, had been his residence since 1920.

Paul F. Mann died February 7, 1943, in Scarsdale, N.Y. Mann was a graduate of Course IV. The Secretary's records indicate that he had lived in Buffalo for at least thirty years previous to moving to Scarsdale in 1943. — JAMES W. KIDDER, *Secretary*, Room 801, 50 Oliver Street, Boston 10, Mass. EDWARD B. ROWE, *Assistant Secretary*, 11 Cushing Road, Wellesley Hills 82, Mass.

1907

Sometime during the early morning of June 9, at his home in Auburndale, Mass., died one of the most active and loyal of Technology Alumni; and one of the most prominent and well-known members of our Class — Lawrence Allen, always affectionately known as "Lawrie." I first learned of this during the forenoon of June 9 through a telephone call at my office from the editor of The Review, and then confirmed it by telephoning to Lawrie's secretary at the Boston office of the United Shoe Machinery Company, where he has been a member of the research department. From her I learned that Lawrie was stricken when at the factory of his company at Beverly, Mass., on the afternoon of June 8, was taken to his home, and at 8:30 p.m. was apparently comfortable and went to sleep, but from that sleep he never awoke. Harold Wonson and I notified by telephone and telegraph several of our classmates, I wrote a letter of sympathy to Mrs. Allen, and a spray of flowers was sent from the Class to the funeral which took place on Sunday, June 11, at St. Mary's Episcopal Church in Newton Lower Falls, which adjoins Auburndale.

Lawrie's friendliness and ability made him popular and sought after for offices

during our undergraduate days, and he was assistant manager and then manager of the track team, secretary-treasurer of Technique electoral committee, member of the Institute Committee and of the Junior Prom committee, and class president during our senior year. He was a member of Osiris, and also of Delta Tau Delta fraternity, in which he has always maintained an active interest. During later years he has served on many special committees of the M.I.T. Alumni Association, has been our class representative on the Alumni Council almost continuously since 1907, and has been our class agent for the M.I.T. Alumni Fund, in connection with which he has given his usual thoughtful, enthusiastic, efficient, and successful effort.

Lawrie followed his professional training of civil engineering for only two years after 1907. He then joined the organization of W. H. McElwain Company, shoe manufacturers, where he remained until 1921. Association with two other firms followed, and in 1927 he became an industrial engineer with United Shoe Machinery Corporation. He was married in 1908 and has two sons, 34 and 33 years old, and a daughter, 29, all of whom are married; and there are four grandchildren.

Future class dinners and reunions will never seem quite the same without Lawrie's genial presence. Rare have been '07 gatherings of any kind during the past 37 years when he has not been on hand. His radiant enthusiasm for living and for all of his many life interests of family, community, business, college, was contagious. His absolute adherence to the fundamental principles of industry, integrity, sincerity, courage, optimism, was manifest through his countenance and his behavior. He was a friend to all, a blessing to his family, a real Christian gentleman.

Not until I saw the May issue of The Review did I know of the death of Ralph H. Crosby, which occurred on June 18, 1943. Had I been aware of this sooner I should have had mention of his passing in an earlier set of our class notes, for Ralph was one of our most interested and loyal classmates. I wrote to Mrs. Crosby expressing the class sympathy, even though it was a belated message, and asking her to tell me of the circumstances and of the present doings of her large family. Between 1907 and his death, Ralph was employed by many different concerns, one of his most recent positions being that of engineer with the Lourie Manufacturing Company in Springfield, Ill. He had many problems of illness and other things incident to bringing up a large family, but always maintained a sweet and hopeful disposition, as I know from rather frequent exchange of letters with him. Although he was never able to come to one of our five-year reunions, he followed with keen interest the doings of Technology men, and especially of '07 men, as recorded in The Review and as told to him by correspondence and personal contact with other men. He often wrote me of the warm degree of friendship that had been shown to him especially by John Frank and Sam Marx of our Class, in Chicago. Ralph is survived by his widow, Ruth J. Crosby, 851 South Illinois Street, Springfield, Ill., by six daughters and one son, and by nine grandchildren. Mrs. Crosby's reply to my inquiry adds the in-

1907 Continued

formation that Ralph had had sinus headaches requiring an operation, which appeared to be successful, but that meningitis had set in, causing his death in two days. At the time, he had been chief engineer for the Keckley Manufacturing Company of Springfield, designing valves and presses.

A. Shirley Black, who was with our Class during our freshman year and was a lieutenant in our Corps of Cadets, died at his home at 19 Mostyn Street, Beach Bluff, Mass., on April 27. He had always been in the insurance business in Lynn, Mass., his home city, and for many years was a member of the firm, Farquhar and Black. He was a director of the Manufacturers-Central National Bank of Lynn, of the Lynn Mutual Fire Insurance Company, the Middlesex Fire Insurance Company, and the Lynn Chamber of Commerce, and also a trustee of the Lynn Institution for Savings. His widow, Marion Black, and a daughter, Mrs. Henry Pevear, survive him.

Some of you men who took Course V may remember Sheldon P. Thacher, who was with us during undergraduate years, though he was not graduated. The *American Bicyclist and Motorcyclist* for April tells of his return to the United States Rubber Company on April 1 after a two-year leave of absence during which he served as chief of the rubber section of the Joint Army and Navy Munitions Board at Washington. Thacher began his work with the United States Rubber Company in 1915 as an experimental engineer, and served successively as technical assistant to the president, manager of tire production, technical manager of tire development, and manager of the tire engineering and service department. His present headquarters is with the company at Detroit, and his home address is 1383 Bishop Road, Grosse Pointe Park 30, Mich.

The gratitude of your Secretaries and of all '07 men goes out to Lawrie Allen, for his fine work as class agent for the Alumni Fund. I hope you have read the fourth annual report of the Fund sent out during last May and have noted that '07 reached 92 per cent of its quota of number of contributors during 1943-1944, which was a little better than for the previous year, and 90 per cent of its quota as to amount of contributions, which was not so good as for the previous year. Eleven more men giving, and exactly \$300 more in money, would have given us 100 per cent in both respects. Now we are off for another year of achievement for the Fund. Let us honor the memory of Lawrie, and support the Institute, by contributing generously and promptly. — BRYANT NICHOLS, Secretary, 23 Leland Road, Whitinsville, Mass. HAROLD S. WONSON, Assistant Secretary, Commonwealth Shoe and Leather Company, Whitman, Mass.

1908

The fourth meeting and dinner of the season was held at the University Club in Boston on May 16. The following were present: Arthur Skillings, Jeff Beede, Stiles Kedy, Harry Lord, Steve Lyon, Sam Hatch, George Freethy, Bill McAuliffe, Harold Gurney, Myron Davis, George Belcher, Joe Wattles, Linc Mayo, and Nick Carter. Following an excellent dinner Joe Wattles showed two very interesting colored sound films dealing with various South American countries and cities. Fred Cole, who could

not attend, wrote in as follows: "I am still on the job in northern Maine. I'm very sorry to miss this dinner and meeting. Blame the war. I hope to attend next season. Regards and best wishes to all." Winch Heath also wrote: "Keep me on the list. I'll surprise you some day. I am living near the job now. Ensign Barbara is now on duty at the Harvard school of communications." Winch's daughter received her commission on March 7 at Northampton, where she had been in training with the Waves.

Harold Gurney recently received the following interesting letter from H. S. Chandler in Montreal: "I hope you will pardon my neglect in not acknowledging the article and charts you sent me a month or two ago. . . . Those first articles were somewhat over my head, although a general impression was obtained. These articles of Cooley's look as though they would be very interesting and readable. Had Dr. Compton been here when you were? He was given a doctor's degree by the Ecole Polytechnique, and Technology Alumni were invited. I ran into Stephenson '09, whom you probably remember. He is running some trade papers having to do with the pulp and paper industry. I am going to Boston soon and will give you a call if I can find time."

We are sorry to report the death of John C. Brooks, which occurred on a train en route from St. Louis to Springfield, Mass., on April 28. He was vice-president and director of the Monsanto Chemical Company and general manager of the plastics division at the time of his death. After graduation from Technology, Mr. Brooks was connected with the Jones and Laughlin Steel Company, and later accepted a position as mechanical engineer with the Indianapolis Water Works. Upon returning to New England in 1912 he became assistant manager of the International Silver Company at Wallingford, Conn., and was later connected with Goodell Pratt Company in Greenfield, Mass. While the plastics industry was still in its infancy, Mr. Brooks became general manager of the Fiberloid Corporation in Springfield, Mass., and when Fiberloid became the nucleus of Monsanto's plastics division in 1938, he was elected vice-president and general manager of its plastic division and subsequently president of the corporation. In addition, he was president and director of the Shawinigan Resins Corporation, a Monsanto affiliate, and president of the Resinox Corporation until its dissolution in 1940. In addition to his other interests, he was an accomplished horseman and at one time held membership in the cavalry of the Connecticut State Guard. The sympathy of the Class is extended to his family.

We also report with regret the deaths of the following classmates, word of which was recently received: Allan Seymour on July 30, 1943, and Aaron R. Merritt, on December 18. — G. Temple Bridgeman, one of the outstanding tin authorities of the world, has resigned as executive vice-president of the Metals Reserve Company and is now associated with the Surplus War Property Administration. Partly because of his activities with the Metals Reserve Company, the United States now has enough tin to supply the necessary requirements for the next two years. — Carl H. Bangs is now at 102 Chatillon Road, Rome, Ga.

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The following letter from Colonel Charles McHenry Steese to Cookie, our Class Agent, may be of interest: "I received a notice on April 1 of some affair that had already happened, with a request for me to purchase a ticket. Instead I sent in a check for \$5 for the Alumni Fund. Today I have your letter, which should make any heart — except that of a hardened old field soldier — melt. Unfortunately a book arrived in the same mail from the Technology Christian Association, asking for a donation. Just to show you that my heart is in the right place, I'm sending another \$8.50, which will make my contribution \$13.50, an increase over last year and about the average for the Class. And the T.C.A. will have to look to the youngsters for support. I miss the gang very much and hope that I shall get to Boston before too long to see you. My last good look was from an airplane, as I sailed over Boston on my trip to London."

Chick Kane replied to the above as follows: "Alton Cook has forwarded your very interesting letter with its enclosure of \$8.50 in favor of the Alumni Fund. This must have come by faster plane than your first one with the \$5 check, as the latter arrived here only this morning. You will no doubt be glad to know that your kind words about the effectiveness of Alton's letter had a very unexpected aftermath. He hadn't realized it was that good, and after rereading it, was so impressed that he doubled the size of his previous contribution! It is seldom that a man's own words appeal to him so strongly."

We think it would be a good idea if some more of you fellows reread some of Cookie's appealing letters. Perhaps you will be inclined to increase your ante as were Charlie and Cookie. — H. LESTON CARTER, Secretary, 60 Batterymarch, Boston 10, Mass.

1909

So far as your Secretaries know, Reverend Elmo A. Robinson, VII, is the only member of '09 who has become an ordained minister. He has also been able to utilize his scientific training to good advantage, particularly at the present time. He writes from Schenectady: "I have not been active in Technology alumni affairs for several reasons: the nature of my work, impossibility of attending meetings, lack of acquaintance — since in Course VII we were somewhat apart from the main stream — and the fact that I happen to have attended briefly a number of colleges, all of which have overdone alumni appeals. I have been glad, however, to renew contact with an atmosphere like that of the Institute and have enjoyed the M.I.T. men whom I have met here and the one meeting which I attended. After graduation I entered upon a theological course and then spent about 15 years in the Universalist and Unitarian ministry. Then, after a brief interlude, I turned to teaching. For 15 years I have been at San José (California) State College, where I am now associate professor of philosophy, although I have also taught, as conditions demanded, some psychology and some mathematics. I still retain ministerial fellowship, but have not been actively engaged in church work since I began teaching. Two years ago I married Elizabeth Magers, professor of physiology at Vassar College. We spent last year in California

1909 Continued

and this year in the East. I have been at General Electric for several months as a technical writer or editor of instruction books to accompany G.E. installations on aircraft. By a former marriage I have two sons: Arnold, who is an army lieutenant in meteorology, and Kelsey, who is assisting in radio research. At times I seem to have departed so far from Technology interests that I recall the old song about using the stuff I learned there just two times. But actually I have always been glad of the training and have found it especially valuable in teaching philosophy. My only dissatisfaction is that there was so little provision for student guidance and that some of what there was was rather poor. Presumably my sojourn in Schenectady is only a temporary arrangement, but I should be very glad to have you look me up when you are here."

Our attention was called by the Alumni Office to a page of a song, "America Our Home," copyrighted in 1917 and 1919, by Lloyd C. Eddy, VI. Inquiry of Lloyd, who is at Riverside, R.I., brought the reply that he did write this song when he saw the indications of impending war back in 1917. He continues: "Despite an overseas clasp and victory medal awarded me in recognition of services, I am at present chiefly interested in obtaining monetary fruit from my maturer labor as an author and engineer, particularly from many writings (including a long script relating to engineering) still unpublished or unproduced. One of the bits of marching verse near the finale of a comedy-lyric screen play that I am trying to induce others to produce commercially seems to fit the music of 'America Our Home,' and the timeliness of its newer lines might contribute to speedy production, thus promoting unity, profit, and victory. . . ."

All of us in Course VI, particularly, remember well the active part that John Mills took in electrical engineering activities, and that in his senior year he was president of the Electrical Engineering Society. Since that time he has been with the Bell Telephone Laboratories and has been very prominent in personnel and other activities. He has written several brochures and books such as *Radio Communication* and is well known among telephone and other electrical engineers. Unfortunately, a few years ago physical disability overtook him. In reply to the announcement of the class outing he writes as follows: "The fact that my legs went bad on me because of circulatory troubles in veins and arteries makes me an even less mobile and cooperative member of the Class than I have been in the past. It makes the June reunion practically impracticable. Give my regards to all the fellows who might remember me. I am pulling along all right, but I need cab and car transportation between home, trains, and office. That interferes relatively little with my work and amusements. As an illustration of the latter, I have just perpetrated on The Review an article entitled 'Forty Years of Electronics,' and on a still wider public a book, *Electronics, Today and Tomorrow*. One could call the article a synopsis of the book. I shall be sorry not to see you but am glad that so many of the old gang still keep coming back. I was a little over age, of course, in 1909 because I had been 1901 at Chicago."

Probably class members have noted that on the alumni ballot Delos Haynes, VI, and Harry L. Havens, XI, were two of the three candidates for the Alumni Association national nominating committee from district no. 9. — Word has been received that Benny Dow, II, is now established in Houston, Texas.

Paul writes: "Bob Weill, who has called me Paul ever since I first saw the family about 1921 when Bob had arrived at the mature age of seven, is his Dad's right-hand man at Skydyne, Inc., at Port Jervis, N.Y., and is also vice-president of the Port Jervis Rotary. Bob is still the lean, lank string bean he has been ever since he grew up. But he has matured splendidly, and now at 29 he'd make an excellent impression anywhere he might go. Long ago Bob asked me to come out and speak to the men in his Rotary about my impressions of the Asia Coast two decades ago in the light of what's happening there now. I'm always happy when I'm lucky enough to be in the bosom of the family of Weill. I always was before Mex and Helen left New York, and now I was entertained by both Mex and Helen and by Bob and his Janet.

"I'd never been in Port Jervis before. The town is on a crook in the Delaware River at the corner of three states where the river makes its way through the hills of the Appalachian chain. It's beautiful country out there in Orange County, which, by the way, is Tom Desmond's bailiwick. Bob has two fine children, Bobby, who is two, and young Miss Arden, who is almost three months old. The disastrous fire in the Skydyne, Inc., plant has of course disrupted Mex's plans; any bad fire would do that, even in normal times. But the work of rebuilding is healing up the scars very well indeed. The roof is going into place, and from what Mex told me his facilities will in a few weeks be better than before the fire. Both he and Helen told of the kind things the townspeople had been doing for them ever since they came to Port Jervis and particularly since the fire, which was a tragic thing, not only for the Weills personally and in a business way but for the town as well. All of Skydyne's work is bound up with plywood products that are light and strong and can be used in airborne traffic. The Army uses most of Skydyne's output. To a casual onlooker like myself, the working of the materials that go into Skydyne's output is a new profession, of which we'll hear more as traffic by air becomes in peacetime as familiar as traffic by rail and water is now."

In the February number of The Review it was stated that Matt Durgin, VI, who was a science and mathematics teacher at Charlestown High School, in his spare time was helping teach electrical engineering in the Army training course at Harvard. It was a considerable surprise to the Review Secretary to learn of his sudden death on May 14 at the Wyman House, Cambridge Hospital, since only a few days before he had been seen out walking with Mrs. Durgin and their dog. He had been losing weight, and it was found that a kidney infection had developed to such an extent that his system was unable to cope with it. He entered the Institute from Cambridge High and Latin, and also attended Boston University and the Lowell Institute. He leaves his wife and a sister, Miss Mary E.

Durgin. The Review Secretary has extended to Mrs. Durgin the sympathy of the Class. — PAUL M. WISWALL, *Secretary*, 90 Hillside Avenue, Glen Ridge, N.J. CHESTER L. DAWES, *Review Secretary*, Pierce Hall, Harvard University, Cambridge 38, Mass. *Assistant Secretaries*: MAURICE R. SCHARFF, 3860 Rodman Street, Northwest, Washington 16, D.C.; GEORGE E. WALLIS, 1606 Hinman Avenue, Evanston, Ill.

1910

As usual, your Secretary finds the news of classmates very meager, but occasionally he receives some notice or information on the activities of various members. A few weeks ago Harold Akerly was in Boston on financial work with the Boston School Board and stopped in for a visit. Another get-together was planned, but owing to Army duties could not be accomplished.

The following was taken from the Newark, N.J., *News* of April 21: "George W. McRae, vice president and general manager of the New Jersey Bell Telephone Co., was elected a manager of the Howard Savings Institution at the last meeting of the board of managers. McRae is a director of the National Newark & Essex Banking Co., Firemen's Insurance Co., Newark College of Engineering and the Tuberculosis Preventorium for Children at Farmingdale, a trustee of St. Barnabas's Hospital, a member of the American Institute of Electrical Engineers, Newark Chamber of Commerce, Newark Defense Council, U. S. Naval Institute, the Newcomen Society of England, New Jersey Historical Society, New Jersey Audubon Society and the Alumni Association of Massachusetts Institute of Technology. He was president of the Welfare Federation of Newark in 1935-36 and has taken an active part for many years in its welfare, health and hospitalization programs and Community Chest and War Fund drives. McRae lives in Short Hills."

Mr. and Mrs. Robert F. Burnett have announced the marriage of their daughter, Marion, to Edward H. Wilcox, an ensign in the Naval Reserve, on April 22, at the United Church, Raleigh, N.C. — Carl Lovejoy has been promoted to the rank of lieutenant colonel and is still with the District Engineers in Providence, R.I. — Frank F. Bell has been advanced to a colonel and is now overseas with a service battalion. — HERBERT S. CLEVERDON, *Secretary*, 117 Grant Avenue, Newton Center 59, Mass.

1911

Once again it makes me proud and happy to find that 1911 is off to another good start in Alumni Fund V. Let's even top our splendid record of 1943-44, which gave us the largest contribution of any single class and placed us second only to 1891 in percentage of subscribers.

In a supplementary letter John Alter, IV, sent me information regarding a talk on "The Architect and the Municipality," which concluded a series at the Boston Architectural Club and was given by our Ralph Walker, IV. "It was well-concentrated information," writes John, "plus a very definite point of view in civic planning. During his talk and explanation of slides he never once let us forget that it was the human community that was being planned. He said that what should be

1911 Continued

sought was fine living conditions, removed from the main traffic arteries and manufactory. R. T. was in good spirits, quite convincing, and of course looks somewhat older. You may remember that he was taken over to England to study the situation there with the English authorities; so he told something of conditions since the bombings, but not for publication." In conclusion Alter said he is still living at 31 Marblehead Street, North Andover, Mass., but is not at present practicing architecture, as he is on the engineering staff of John W. Bolton and Sons, Inc., Lawrence, Mass., manufacturers of paper-mill machinery, knives, bars, beater rolls, and so on.

From Nowata, Okla., comes word that Bill Warner, I, has been selected as a Republican presidential elector in that state, and that he hopes to have a chance of casting the vote. Bill adds: "One of the local Nowata boys was recently decorated by George Kenney, I, and the letter from George to the boy's mother was printed in the local paper. It is so good that I enclose a clipping. This boy, incidentally, attended radio school at the Institute for several months. In my opinion this is a splendid letter and certainly did a lot to boost the morale of the parents of the many boys from this small district who are in the service."

In the letter, Lieutenant General Kenney told the boy's mother exactly what her boy had done in action over Wewak, New Guinea, to receive the Silver Star. He closed with these statements, so typically Kenney-esque: "Almost every hour of every day your son and the sons of other American mothers are doing just such things as that here in the South Pacific. Theirs is a very real and very tangible contribution to victory and to peace. I should like to tell you how genuinely proud I am to have such men as your son in my command and how gratified I am to know that young Americans with such courage and resourcefulness are fighting our country's battle against the aggressor nations. You, Mrs. Rouscole, have every reason to share that pride and gratification."

Although details are lacking, it is very fine to learn that Gus Frigon, VI, has been made chairman of the corporation of the Ecole Polytechnique, 1430 St. Denis Street, Montreal, P.Q., Canada. He has been a professor there for many years and is also honorary secretary for M.I.T. in Montreal. We're proud of you, Gus, and wish you every success in your new responsibility! We were also glad to note the election of Carl Ell, XI, for a three-year term on the board of directors of the Boston Chamber of Commerce. And we have another junior 1911 wedding: On June 1, at Winter Park, Fla., Gail Hunter DeForest, daughter of Norman DeForest, III, was married to Paul H. Harris, a lieutenant in the Army Air Forces.

Jim Campbell, I, has moved his firm — Eadie, Freund and Campbell, consulting engineers — to Room 1702, 500 Fifth Avenue, New York City. Word also reaches us that George Garnsey, V, formerly of Syracuse, N.Y., is at Mayaguez, Puerto Rico (address: General Delivery). G. Arthur Brown, X, is at 10111 Pierce Drive, Silver Spring, Md.; Norman Duffett, X, at 909 James Avenue, Niagara Falls, N.Y.; and Carl G. Richmond, now a colonel, at

5417 Mohican Road, Washington 16, D.C. — Thus ends another volume of 1911 class notes, with the next starting in the fall. So, a good vacation, and when autumn comes — that's it, "Write to Denniel" — ORVILLE B. DENISON, *Secretary*, 82 Elm Street, Worcester 2, Mass. JOHN A. HERLIHY, *Assistant Secretary*, 588 Riverside Avenue, Medford 55, Mass.

1912

The Boston *Herald* prominently mentions Erwin H. Schell as one of the members of the Boston Committee for Economic Development. Postwar planning for the development of Boston is being ably handled. — Jerome C. Hunsaker, recently speaking before the House Appropriations Committee, warned Congress that millions of dollars would be needed to continue research work of the National Advisory Committee for Aeronautics, of which he is chairman. "The present margin of Allied air superiority," he stated, "is so narrow that Germany could conceivably repeat in reverse the history of the Battle of Britain."

Your Secretary enjoyed a very pleasant visit from Rudy Fox and his wife, who came on from Denver for the graduation of their daughter Phyllis at Wellesley. Rudy is very busy, as his firm, the Vulcan Iron Works of Denver, is a contractor for winches and other marine equipment for the Navy. — We also had a good chat last week with Bill Bird, going down on the five o'clock to New York. Bill had been in Boston to see his son, who is about to shove off in the armed services. Bill is extremely busy polishing up several million toothbrushes for the armed forces; as well as managing Prophylactic, he also helps out on Listerine and other allied products. — Johnnie Noyes is a man of varied interests, as in addition to his vice-presidency of the American Society of Mechanical Engineers, he was also a delegate to the American Unitarian Association meetings held in Boston in May. He was so busy that I couldn't see him, but he reports being in the best of health and hopes to have more time on his next trip.

The Alumni Fund figures for last year show 1912 as having reached 101 per cent of its quota of contributors but only 86 per cent of its quota of contributions. Let's all try to put ourselves over the top in both respects for 1944. — FREDERICK J. SHEPARD, JR., *Secretary*, 125 Walnut Street, Watertown 72, Mass.

1914

These notes must be prepared just before our 30th reunion. The actual reporting of this event must accordingly wait until the fall issue of The Review. The sign-ups, however, indicate a large attendance, and have already exceeded the attendance at the 5th and 15th reunions.

Since the list of the sons and daughters of our Class in the armed services was prepared a month ago, four additional classmates have reported the activities of their sons. Charlie Fox has a son in Chungking, China, with the Army intelligence unit. George Perley's son is in the European theater as a private, first-class, in an Army Air Force Ordnance maintenance unit. Frank Ahern's son has been in the Navy V-7 unit at Cornell and is scheduled to receive his degree just about reunion time. After

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boot training he will receive a commission as ensign. Dave Gould has two sons in the services — one a second lieutenant in the Army Air Forces, and the other, a private, first-class, in the Marines.

Brigadier General Jack Wood, regrets that he cannot cross the country to attend the reunion. Although formerly stationed in the East, he is now in the far West. Colonel Lucien Burnham also is unable to make the trip across the country, being stationed on the West Coast. Although Burnham writes that after service in Ireland it looks as if he were scheduled, temporarily at least, to be a "swivel-chair commando," such an assignment did not prevent him from getting out to the Marshall Islands show with a Marine division. His unit was bombed, and Burnham reports losing nearly all the personal possessions he had with him but himself coming out with only a wrenched knee.

Twice in the past month 1914 men have been grouped en masse in articles regarding members of the Class. The Boston *Globe* carried two feature articles on Don Douglas, one of which brought in various other classmates who had been associated with Don, not only during undergraduate days but also in later days. It told of Porter Adams' work with him on the early M.I.T. wind tunnel experiments, as well as the association with H. K. Chow on these same experiments. Chow, it may be recalled, was the inventor of a Chinese language typewriter. This particular article also had reference to our German classmate, Werner T. Schaurte, who is in Canada. Schaurte had a factory in the Rhineland district and has visited in this country several times since graduation. In addition to Don's many other honors, he has recently been elected vice-president of the Aeronautical Chamber of Commerce.

The other classmate to receive some wide publicity is our honorary member, William Jackson. *The Tech* for April 28 carried a biography of him, telling of his association with the Institute, dating back to the Boylston Street days. In part the article said, "Mr. Jackson is very proud of his honorary membership in Technology's Class of 1914. His eyes beam with pride when he talks about many fourteeners who have achieved fame . . . , and goes on to mention several of the Class who have been in the public eye.

Reeves Newsom was recently appointed village manager of Scarsdale, N.Y. Since graduation Newsom has occupied various municipal positions and has also been associated with public utility enterprises, particularly in the field of water supply. Our class artist, O. C. Clisham, was one of the exhibitors in an exhibition recently held in Boston by an organization known as the Boston Business Men's Art Club, which has the subtitle, "The Men Who Paint for Fun." Clisham's regular activity is being a math instructor at Wentworth Institute, Boston. Clarke Atwood is one of the '14 men who spends a lot of time traveling by air throughout the country. He recently received an "Admiral of the Flag Fleet" certificate given to people who have done a lot of commercial flying on the American Airlines. Atwood is now operating his own research laboratory and is entirely separate from the National Dairy Company with which he was formerly associated.

The following items have been gleaned from some of your returned questionnaires

1914 Continued

Ross Barratt is a lieutenant commander stationed at Norfolk and is assistant aerological officer of the Naval Air Station there. He reports that he has a spare bed for any visiting classmates. Nelson Baxter, who is a sales engineer with Johns-Manville at Peoria, Ill., writes that he would be happy to contact any of our sons who may be stationed in camps in that area. Corn Callahan, who is the proprietor of Associated Appraisers, has moved to 2 Rector Street, New York City, where he would welcome any of us.

Crocker, the class expert on smells, has now extended his work to flavor and is at the present time writing a book on this subject. He is going to give a talk before the Institute of Food Technologists in Chicago just following the class reunion. And speaking of authors, General Alden Waitt's book on chemical warfare has had such a wide sale that it has gone into its fourth printing with a completely revised edition. Harold Danforth, among others, is spending a good part of his time in Washington, although his home station is in New York where he is with the United States Commercial Company, which operates from the administrator's office of the Foreign Economic Administration. His work consists of the study and development of communications within and between the Latin American republics, and also between them and the United States.

Walter Eberhard, who has spent most of his time since graduation at the Institute in the Department of Graphics (which we used to know as mechanical drawing and descriptive geometry) as an instructor in that field, has been promoted to the grade of assistant professor. While Al Hanson has not made any change in his position as mechanical superintendent of the Government Printing Office at Washington, it does not require very much stretching of the imagination to understand that Al has been exceedingly busy. Most of us know that the Government has not reduced its printing during the war! Anyone who has had occasion to visit the United States Naval Station at Patuxent River in Maryland will certainly have marveled at the size of that base and its creation out of a good deal of wilderness land. The chief architect and structural engineer for this enterprise was none other than our own Paul Howes. Bill Lucas, who has retired from the Army, is very busy in the war effort helping out Don Douglas as co-ordinating inspector for his tooling division. Harold Mayer is always hopeful that we will hold some reunion out in the Northwest. Mayer is located in Portland, Ore., dividing his time between real estate management and some teaching.

Phil Morrill makes the boast that he is one of the very few of us who have been with the same company continuously since June, 1914. Phil is located in St. Louis, where he is vice-president of the Bemis Brothers Bag Company. His daughter, Jane, was married last winter in Honolulu to a lieutenant in the Navy. Another classmate who has not made many changes is Howard Morrison, whose salary comes from Lever Brothers, where he is mechanical superintendent. But through the winter his chief interest is in curling. Last winter he took part in the United States-versus-Canada bonspiel. George Perley writes that his daughter, who graduated from Mt. Hol-

yoke, is helping the war at the United Aircraft Company, where she is junior analyst in the research division. George has a son entering Technology this summer. Clarence Rogers is now located at Atlanta, where he is a sales engineer with the Edwin L. Wiegand Company of Pittsburgh. Lieutenant Colonel Ralph Salisbury is executive officer of the supply branch, Ohio River division, United States Engineer department. From some of the flood difficulties through that general area we can imagine Ralph has been having a busy time. Although Howell Taylor is operating his own architectural office at Ann Arbor, Mich., he is at present on an assignment as architect inspector for the Home Owners Loan Corporation conversion projects. — H. B. RICHMOND, Secretary, General Radio Company, 30 State Street, Cambridge 39, Mass. CHARLES P. FISKE, Assistant Secretary, 1775 Broadway, New York 19, N.Y.

1915

1915 is doing all right on the Alumni Fund. Eighty-seven men (50 per cent quota) have contributed \$1,897 (64 per cent quota). Keep up the good work so we can hit 100 per cent as soon as possible. All we need is some good checks from you fellows who gave last year but have not given this year.

Classmates newly in the service and both as captains are Edward F. Waldron and Harold Worthington. Here is our first letter from a 1915 man in service overseas, Lieutenant Colonel James A. Tobey: "I wrote you a letter early in March, but the Base Censor deprived you of the undoubtedly pleasure of receiving it because of my inadvertent mention of a specific locality in Italy where I was doing work with Yugoslav refugees last January. I had charge of 14,000, who have, incidentally, been written up and pictured in a number of widely published magazines. . . . In the past year I have seen a good deal of service in North Africa and the Sicilian and Italian campaigns. I was then transferred to this theater of operations, where I hope to see some more action. . . . One of our classmates, Ralph Mendelson, is here at the same post. For a while we occupied adjoining bunks. He was once physician to the King of Siam and attended the School of Military Government with me. I see him only occasionally now, as we are in different types of activity. . . . Except for a short leave in London during several blitzes and trips to Oxford and Bath, I haven't seen a great deal of England, but what I have seen I like. In Italy I was, of course, closely associated with the British. . . . Give my regards to all our 1915 friends, including yourself." Thanks, Jim, and good luck to you and Ralph Mendelson. I hope you both meet St. Elmo T. Piza somewhere in England. His address is care of Board of Economic Warfare, American Embassy, London.

A rear admiral in the Chinese Navy, Pellian T. C. Mar, has sent us a very interesting letter, his first since graduation and most welcome. He writes from 2020 Sixteenth Street, Northwest, Washington, D.C.: "It was a pleasure to read your letter of March 8. I am, indeed, very glad to be back here again after some 27 years. Your letter has once more recalled to my mind many vivid recollections of the pleasant

days and congenial fellowship among our classmates during our undergraduate years. . . . It was nice of you to suggest that I write something about myself for the class notes. . . . I really have done little that is worth mentioning, but at your suggestion, this account of myself may be of interest to my classmates: Registered with the Class of 1915, I was graduated in 1916 with an M.Sc. in Course XIII-B. I returned to China in 1917 and was appointed as junior naval constructor at the Foochow Dockyard, and concurrently as an instructor of marine engineering at the Chinese Naval Academy in 1917. I was promoted to superintendent of works in 1923, and to the directorship of the same dockyard in 1926. In 1925 I planned and carried through an irrigation project for the Fukien provincial government for 100,000 mows (approximately 16,000 acres) of paddy field. I was promoted to directorship of the Kiangnan Dock and Engineering Works at Shanghai in 1927, but resigned in December, 1930, and in 1934 was reappointed as its director with the rank of rear admiral. I am now in the United States as head of the Chinese Naval Construction Mission, consisting of naval constructors, marine engineers, and supervisors, to study the modern methods of shipbuilding."

Phil Alger, Schenectady: "I have become a grandfather, as of last August; the young man is named Timothy Chandler Prince and lives at Marblehead, Mass. My oldest son, John, is now just 16 and practically 6 feet tall. He has an engineering bent and (I hope) will go to M.I.T. if the war permits. . . . I continue to be occupied with assorted engineering work with the General Electric Company and have recently become chairman of the company's general standardizing committee. Among outside activities may be mentioned my nomination for a director of the American Institute of Electrical Engineers, two articles in the *Scientific Monthly*, and my duties as president of the board of trustees of the First Unitarian Society of Schenectady. . . . I hope you are laying plans for our 30th reunion next year, when we may celebrate the end of the European phase of the war." — Wilbur A. Swain, East Orange, N.J.: "You are doing a fine job with the class notes. About me? I had hard luck on January 1. The Company said: 'You work here in New York City.' So that is how I lost my nice beat in New York State. . . . My son is married and living in Stamford, Conn.; therefore he's off our ration books. My daughter is in a Connecticut college." Fanny Freeman, Boston: "I have been spending the last two years as assistant director of defense training with the city of Boston Committee on Public Safety; hence you may blame me for whatever you or your friends may or may not have learned about the warden business, such as how to tackle an incendiary bomb, or other improbabilities. . . . But since this business of devoting time and good planning to something which may never happen is just what most architects do most of the time anyway, I have found myself right at home on the job. . . . What I am trying to do now is to convert a wartime organization into a peacetime proposition: I hope to turn the splendid warden setup into civic groups which will continue in time of peace to function for the safety and welfare of

1915 Continued

their communities and incidentally promote some new building and civic improvement projects."

Francis Hann, Beverly Hills, Calif.: "It seems years since I last saw you and the bunch." — Allen Abrams, Washington, D.C.: "I am finishing off a year here with the Office of Strategic Services . . . where my work was most interesting and, I hope, profitable to the United States. . . . Now I have to get back to my own business in Wisconsin. . . . I have seen a good bit of General Alden Waitt '14 and other Technology men but not many of 1915." — Warren C. Whitman, Boston: "Having taken an active part in most Salvation Army, Red Cross, and Community Drives for the past ten years, starting as company chairman and winding up this year as a district chairman in my town of Winchester on the Community Drive, I am sensitive to your gentle touch. See that all the boys get one of these jobs, and you'll have a much easier time raising money. . . . For a while I got a big kick out of some of the regulations and shared my amusement with a good many Rotary and other groups. It is needless to say that I soon sobered off and have resolved to side-step any more speaking engagements for the duration. I cannot, however, resist this last gripe. A food from India that we must import in the name of the Commodity Credit Corporation costs fifty cents per pound, cost and freight, Atlantic port. Before the Commodity Credit Corporation will release it to us, in addition to duty and all other regular expenses, we have been paying them 7 cents per pound and donating 10 cents per pound to be divided between the American and Indian Red Cross. Today, we pay the C.C.C. 27 cents per pound, the Red Cross nothing. Complicated, yes! But it helps keep the cost of living down." In explanation, Whit is manager of the import department of the H. A. Johnson Company, Boston, manufacturers and distributors of food products.

Charley Blodgett, Brooklyn, N.Y.: "I am sorry to have missed the party at Ralph Hart's . . . everything seemed to pile up right at that time. I have a good job with a fine outfit. It feels a bit odd, after being around paper and pulp mills so long, both as to type of work and also to be with an industry that seems to have a little money to spend if you want something done." — Ray Stringfield, Los Angeles: "I'll now get this note and my check off to the hard working Class Secretary, and my conscience will be reasonably clear. . . . If you would stay at home once in a while, you might have some unexpected visitors. I got into Boston recently on company business for the first time since graduation in 1915, spent the week end with Art Keating '17, and was sorry not to be able to locate you on the telephone. I visited Gordon Jameson in Boston, and in New York spent an evening with Ray Walcott, whose inherent dignity didn't prevent him from showing the western visitor the scenery at the Diamond Horseshoe. I hope I can make Boston again sometime before another 29 years, but it seems that every time I get as far as New York or Washington, something makes me hurry back. . . . Consolidated Vultee is still making airplanes, as perhaps you've heard, and there still seem to be enough technical problems to keep us all busy. The materials picture is really bub-

bling, and although I sneaked into the aircraft industry in the guise of an expert in rubber and plastics, I find myself putting half my time on the metallurgy of aluminum and magnesium, with doses of electroplating, anodizing, spot-welding, and so forth on the side. Come out to California, and we'll take a couple of days off and show you the movies and feed you some Spanish food."

Sam Eisenberg, Boston: "When a man reaches middle age and his future is largely behind him, he is usually inclined to talk about matters other than personal. . . . You remember meeting my son at the last Alumni Dinner. He is now on active duty attached to the air arm of the Pacific fleet, as is my daughter's husband, Lieutenant Ralph Eliot Peters. . . . My business, since Pearl Harbor, has not suffered to any great degree, except that I lost most of my draftsmen and, of course, have had to work twice as hard to get the jobs out with a skeleton organization. All circumstances considered, business has been pretty good. Now and then I run into a member of the Class, and we discuss old times. . . . Aside from business, I give what time I can spare to outside activities — the Russian War Relief, the American Jewish Congress, the Office of Civilian Defense, of which I am an official connected with the technical group for the city of Boston and the town of Brookline. . . . I have one son who is finishing at Thayer Academy this year. He has made application for admission at Technology and hopes for an appointment to either West Point or Annapolis. When he leaves to join the service, Mrs. Eisenberg and I will be back to exactly where we started in 1916."

With a liberal check for class dues, Howard M. Sawyer, of Andover, Mass., writes: "I hope this will not prove too great a shock to you. Consider me paid up to date." — Stanley Osborne, State Commissioner of Health, Hartford, Conn.: "I was first appointed to this position in 1922 and have just been re-elected for a term to end in 1947. I received an honorary Sc.D. from Tufts in 1943. The personnel of the State Department of Health had a portrait done of me, by Deane Keller of Yale School of Fine Arts; it now hangs in this department. It was some surprise and was presented with suitable ceremony." Our classmates do get around with their honors!

Howard King, long with Mason and Hanger Company, has a new address at the Badger Ordnance Works at Baraboo, Wis. It sounds interesting, Howard; let's hear what you are doing there. — The splendidly prepared reports of the Boston Manufacturers Mutual Fire Insurance Company and Mutual Boiler Insurance Company of Boston reflect the able leadership and guidance of Marshall Dalton, President of both companies. — Herb Anderson and his Fidelity Machine Company of Philadelphia gain additional honors. "Under Secretary of War, Robert P. Patterson of the War Department on April 15 advised the men and women of the Fidelity Machine Company that they had won for the third time the Army-Navy Production Award for high achievement in the production of war material. This is the second white star to be added to the Fidelity Army-Navy 'E' pennant and it is in recognition of the continued maintenance of the high standard

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set for production by the company." — A letter from Ken Kahn of Hollywood, a short time ago, says he is now working at Lockheed in charge of the oils and chemicals group in the plant engineering department. Ken adds: "There are quite a few Tech men here and they are having get-together dinners from time to time. Ray Stringfield is out here with Vultee." — Ben Neal, Buffalo: "I went to an alumni dinner recently at Niagara Falls to hear Jim Kilian. Bill McEwen, George Easter, Burnham Field, and I were there from '15. Out of a group of 25, how's that for good class representation?"

With the close of this year's Review season I extend my thanks to all my classmates who have so generously supported the Alumni Fund and our class dues and have so warmly remembered me with letters and hospitality. Recently in Buffalo I spent a delightful afternoon and evening with Ben and Margaret Neal and Gabe and Tess Hilton. Nothing I can tell you would properly describe the generosity of their hospitality or the joy of their company. If any of you, or your families, are in Boston this summer, be sure to see me. My telephone number at home is LONGwood 3438, and my office telephone is LIBerty 8815. So ends the year and remember — next year 'help Azel'. — AZEL W. MACK, Secretary, 40 St. Paul Street, Brookline 46, Mass.

1916

On March 22 at a meeting of the Boston Society of Civil Engineers, which I am told is the oldest engineering society in the country and one of the largest, having a membership of 800, Samuel M. Ellsworth was elected president. So that Walter Binger may have the necessary information for our class biography, the following is the story of Samuel Ellsworth since graduation: He is a consulting engineer at 6 Beacon Street, Boston. He was graduated from Technology in 1916 and in his early career was connected with the Massachusetts Department of Public Health and the United States Public Health Service. Mr. Ellsworth was a lieutenant of engineers in an American Expeditionary Force water-supply regiment in World War I, after which he was associated with Morris Knowles, Inc., Pittsburgh; with Weston and Sampson, Boston consultants; and the North Jersey district commission on water supply for Newark and other towns in that area. From 1926 to 1932 he was with Metcalf and Eddy, Boston engineers. Later he entered private practice in the fields of water supply, sewage, waste disposal, and general sanitation. He was consultant for the National Resources Board for New England on river and harbor sanitation, a member of the Boston works projects board, and consultant on water supply and sewerage for the government military reservation at Camp Edwards, Mass. Mr. Ellsworth has also lectured on sanitary engineering design at the Harvard Graduate School of Engineering.

From clear across the country we hear from Alexander Brest, who is a lieutenant colonel in the Army. Alex is director of training at Geiger Field, Wash., where he teaches aviation engineers to build the air-dromes so that the Air Forces will have landing strips and other facilities for flying

1916 Continued

airplanes. "In addition to constructing runways," he says, "aviation engineers must be prepared to defend them against attack, camouflage them, and destroy them in the event of abandonment. Many of the specialists required for this work are trained here at our specialist school, which, of course, is streamlined in a very concentrated manner. Having lived in Florida for the last 25 years, I cannot help but compare the climate here with that of my adopted state, and I am quite sure that the Florida Chamber of Commerce will be very proud of its representative when it comes to advertising our sunshine state. One radio commentator expressed my views thus: 'It is amazing how the California sunshine washes out bridges.'" — JAMES A. BURBANK, Secretary, The Travelers Insurance Company, Hartford, Conn. STEVEN R. BERKE, Associate Secretary, Berke Moore Company, Inc., 11 Boylston Street, Brookline 46, Mass.

1917

Clair Turner completed 25,000 miles of travel between the beginning of February and the end of May and then decided to leave for California for several months' stay at the University in Berkeley. He visited Brazil, Chile, and Peru on health education work under the auspices of the Coordinator of Inter-American Affairs, Nelson A. Rockefeller. On his return he left a conference of public health authorities in Lima, Peru, on Wednesday, spent half a day at conferences in the Canal Zone and Washington, and landed in Cambridge on Friday evening of the same week.

In his *Chicago Journal of Commerce* column Wilbur Brons wrote recently: "No less an authority than Dr. Walter G. Whitman of the chemicals bureau of the War Production Board has tossed the rose to the nation's beverage distillers. They represent in Dr. Whitman's opinion 'an almost unparalleled example of the overnight conversion of an entire industry from peace to war.' Without their huge productive capacity, the doctor adds (and this is where the rose comes in), the country's wartime alcohol needs — particularly the urgent need of the synthetic rubber industry — could not have been met." Although this is not the first time that the distillers have induced Whit to do some tossing, the recognition of his position as an authority is most gratifying. Seriously, word comes frequently from Washington that he is doing a marvelous piece of work and setting high standards of accomplishment. — Another petroleum executive, Richard T. Lyons, manager of the land and geological departments of the Tide Water Associated Oil Company, has recently been elected vice-president of the company.

Frank Maguire recently called attention to references regarding '17 men, which he had found in his reading. The April issue of *Coronet* has an article about Brigadier General Albert Hegenberger. Quentin Reynolds in his best seller, *The Curtain Rises*, describes an incident in the Mediterranean of a tanker bursting into flames in a convoy and attracting Nazi bombers. The fire was attacked most skillfully and the tanker towed out to where it wouldn't act as a beacon to guide the bombers. "We breathed with relief as the burning ship receded into the distance. The flames had died down and

then went out altogether. The fire hadn't lasted more than twenty minutes."

"I bet Sully was on the job there," I said to Packard.

"Sully never misses," Pack said. "The guy is a genius." The Sully was of course Commodore William A. Sullivan of the Class of 1917. He was on the job. — RAYMOND STEVENS, Secretary, 30 Memorial Drive, Cambridge 42, Mass. PHILIP E. HULBURD, Assistant Secretary, Phillips Exeter Academy, Exeter, N.H.

1919

Our 25-year reunion jamboree is almost here. On July 28, 29, and 30 our Class will hold forth at the Norwich Inn, Norwich, Conn., for three happy days together reminiscing about undergraduate years at the Institute, reviewing high spots of the past quarter century, and celebrating the 25-year milestone. On May 10 your Secretary had lunch with Will Langille, Don Way, Fred Given, and Leo Kelley at Pappas Restaurant to discuss plans. The committee has been working hard and has a very well-ordered program which includes softball, golf, swimming, and a banquet on Saturday night with some real entertainment. Prizes have been arranged for those who excel in sports, and souvenirs of the occasion will be presented to all. The committee has even arranged for private cars to meet the trains arriving at New London and deliver the victims to the Norwich Inn. If you have not already written to the Secretary that you will be present, do so at once. Mixed luncheons for the wives will be held in New York and Boston prior to the reunion at Norwich. The New York luncheon date is set for Wednesday noon, July 26. Fred Given is making the arrangements for this luncheon, and if you have not received notices from him or indicated that you are attending, write him care of Bell Telephone Laboratories, 463 West Street, New York, N.Y. Al Richards is handling the Boston luncheon. Communicate with him care of Dewey and Almy Chemical Company, 62 Whittemore Avenue, Cambridge 40, Mass.

Jesse Stam writes to say that he will be present at the reunion in July. Jesse is with Fairclough and Gold, Inc., 470 Atlantic Avenue, Boston, Mass. — Benjamin H. Sherman is a member of the firm, Charles W. Hills, patent attorneys, 53 West Jackson Boulevard, Chicago. He writes: "I shall certainly try to be at the reunion on July 28, 29, and 30 but cannot say with certainty this far in advance." Ben has four children — two daughters, 20 and 15, and two sons, 18 and 17. — Ernst Voss writes from 357 Humble Building, Houston, Texas: "At the outset, I wish to tender my abject apologies for my tardiness in responding to your appeal in connection with the 25th reunion of the Class. I am sure you can appreciate how little time one has to devote to personal matters in these busy days." Ernie is chief refinery engineer in charge of design, construction, and maintenance of Humble's Oil and Refining Company. Ernie had charge of planning and constructing a large synthetic toluol plant for the Ordnance Department and is now working on three large plants financed by the Defense Plant Corporation in connection with the synthetic rubber program. Ernie has a son, aged 11, and a daughter, aged 7. —

Myles F. Connors, Woolworth Building, 233 Broadway, New York, writes: "On account of health conditions, I am not sure that I shall be able to attend the class reunion in July; nevertheless, I am keeping the date before me and shall make every effort to do so. In the meantime, I enclose a brief biographical sketch and a snapshot." Myles is an investment counselor serving Princeton University, Swarthmore College, the Institute for Advanced Study, Battelle Memorial Institute, Howard University, one commercial bank, and a number of individual clients. Myles is married, has three children — a daughter 22, a son 18 in the Navy V-12 unit taking engineering at Villanova College, and a son 12 in elementary school. — Al Richards has forwarded Roy Burbank's excellent compilation of information from *The Review* over the past 24 years.

George Michelson, who is vice-president of the J. Slotnik Company, 38 Newbury Street, Boston 16, writes: "Congratulations on your speedy action in obtaining the Norwich Inn at Norwich, Conn., for the reunion in July. If there is anything I can do to help with the reunion, please do not hesitate to call on me." In the March 26, 1942, issue of the *Engineering News-Record*, George had an excellent article on the subject, "Housing Built on the Double-Quick." — An address on the subject, "The Contractor's Contribution to the Post-war Construction Program," was given by Isidor Slotnik at the Associated General Contractors of Massachusetts postwar construction conference held at the Statler Hotel on November 8, 1943, and was printed in the *Bay State Builder* for December, 1943. The biography of Slotnik stated that he was a member of the board of governors of the Associated General Contractors of America and also president of the Associated General Contractors of Massachusetts.

Mrs. Frances L. MacKirdy, 697 East Jefferson Avenue, Pomona, Calif., wrote on May 2 to state that her husband, Howard S. MacKirdy, a colonel in the Coast Artillery, died at the Walter Reed Hospital in Washington, D.C., on November 26, after nearly 27 years as an army officer. He was director of training at the antiaircraft artillery training center, Fort Bliss, Texas, at the time of his sudden illness and death. He left his wife, and three sons who are in the antiaircraft service.

Richard S. Holmgren, 3028 College Avenue, Berkeley, Calif., is project engineer on the construction of floating dry docks for the Navy with the shipbuilding division of the Pacific Bridge Company, at Alameda, Calif. Richard has two sons, 16 and 15, and one daughter, 7. — James G. Strobridge is a lieutenant colonel in charge of the production division of the Army map service in Washington, D.C. Jim was vice-president of the Strobridge Lithographing Company in Cincinnati prior to his call to active duty in the Army Corps of Engineers. — Paul Swasey writes from 3262 Gunston Road, Parkfairfax, Alexandria, Va., where he has taken a leave of absence from the Virginia Electric and Power Company to do some special work in the War Department Office of Chief of Engineers. Paul's daughter, Joanne, is in college at Salem, N.C. Paul expects to be at the reunion at Norwich.

1919 Continued

Kenneth F. Wood of 13 Church Street, Framingham Center, Mass., writes: "A lot has happened since that farewell night on Rogers steps in our freshman year. For the past 13 years I have been located here in Boston with the United Drug Company. Previous to that I was with the Dennison Manufacturing Company in Framingham."

The March 20 issue of the *Journal of Commerce* carried an announcement of the advancement of Arthur S. Johnson from assistant to the manager of the engineering department of American Mutual Liability Insurance Company to assistant vice-president. He has been with the company for the past 20 years. — Edward Ellis Scofield wrote on April 15 from West 450 15th Avenue, Spokane, Wash., where he is a member of the board of directors of the Oconto Company and the Bay de Noquet Company, which operate to produce lumber in northern Wisconsin and northern Michigan. He is also with the Washington Water Power Company in Spokane, seeing that the large customers are given the sort of electric service they pay for. Edward sends his regrets that he will be unable to attend the reunion this year because of the distance. He is married and has three children — two daughters 12 and 8, and one son, 10 months. — George C. McCarten has left the American Cyanamid Company and is now manager of manufacturing for the Armstrong Company, manufacturers of putty and other materials, at 241 South Post Street, Detroit. He has three daughters, has been living at Bound Brook, N.J., and will now move to Detroit. The Armstrong Company has plants in Chicago, Detroit, and Dallas. George has recently heard from George Fleming, now working in Hartford, Conn., on postwar planning for new products for his firm.

Marshall C. Balfour has returned to his post in Delhi, India, for the Rockefeller Foundation. — Commander Roger T. Hall's address is 1411 Glenn Street, Vallejo, Calif. — David C. Sanford, Jr.'s address is High Ridge Road, Route 56, Stamford, Conn. — R. R. Litehiser, a colonel in the General Staff Command, wrote in to give his new mailing address in Newport News, Va. — Blake Darling, who is assistant manager of the Travelers Insurance Company at the Pacific Coast department, 315 Montgomery Street, San Francisco, has two children, Michael, 18, who is in the naval air corps, and John, 13.

Captain Weiskittel dropped into the office on April 26 to say hello, but your Secretary missed his call, being at the time in California for two weeks. While out there, he talked to Jimmy Reis over the telephone. Jim has his nose to the grindstone in charge of metallurgical work for an aircraft corporation. Your Secretary was also in Houston, Texas, toward the end of May, keeping his fingers crossed so that he might be present with the Class at Norwich. Everybody out! — EUGENE R. SMOLEY, *Secretary*, The Lummus Company, 420 Lexington Avenue, New York 17, N.Y. ALAN G. RICHARDS, *Assistant Secretary*, Dewey and Almy Chemical Company, 62 Whittemore Avenue, Cambridge 40, Mass.

1920

It will be a shock to all of you, as it was to me, to learn of the untimely death of Cliff Rathbone in Providence on March 27.

Cliff is survived by his wife, who was our classmate, Dorothea Brownell Rathbone; by a son, Henry B. Rathbone, a midshipman at Annapolis; and a daughter, Dorinda, who is a student at the University of Washington in Seattle. Cliff was construction engineer for the Old Colony Co-operative Bank. Previously he was general superintendent for Mahoney and Tucker, building contractors, and later he engaged in general contracting under his own name. He built the branches of the Providence Public Library in South Providence and Smith Hill. He was a director of Builders Iron Foundry. Dorothea writes, "There is so much I could add, but I will just say he was a good Texan and a man worthy of M.I.T. His was a life of courage, and though he knew the end was near, he carried on to die with his boots on. If you could know his children, you would know that in them as well as in his work he made his contribution to the world. He left a satisfactory heritage. Well, the rest of 1920 can carry on. Let us hope better days will be on hand for the 25th reunion." You may be sure that I have conveyed to Dorothea the deepest sympathy and the whole-hearted support of the entire Class. Those of you who would like to write Mrs. Rathbone may reach her at 24 Kingston Avenue, Providence.

Lieutenant Colonel Fraser Moffat is now in Montrose, Pa. John Visscher has left Hartford and is now in Waterbury, Conn., at 43 Rockhurst Drive. Joshua Muss is now in North Bergen, N.J., 324 78th Street. Bob Pender is still holding forth in Lynn, Mass., at 6 Lakeview Place.

It is a pleasure to report that we have at least one up-and-coming member who is interested enough to answer my request for suggestions on the 25th reunion, now only a year away. Ed Farrow writes: "Although my associations with the Institute have been many and intimate during the years since graduation, I have been able to attend only one class reunion, our 10th. I do hope to be on deck a year from now at the 25th, though I hate like sin to think we are celebrating that many years since 1920. I have always felt that Technology reunions should be in the vicinity of Boston, so that those of us from out of town could have the opportunity for visits to the Institute itself as well as to the reunion, but wherever '20 has its reunion, I assure you I will try to be on deck."

Tentative plans are, as I have mentioned before, for a reunion point halfway between New York and Boston. The Class of 1919 is having theirs at Norwich Inn, which many of you will remember as the place of our 15th. Even if you have no specific suggestions at this time, it would be mighty helpful to us to have word from you that you are interested and are planning to be on hand. — HAROLD BUGBEE, *Secretary*, 7 Dartmouth Street, Winchester, Mass.

1921

Joseph J. Schaefer, X, is the recipient of our sincere thanks for prompt action on our first Fund letter as well as for his complimentary remarks. Joe says, in part, "After ten years with Sharples Chemicals, Inc., of Philadelphia, I have resigned as vice-president and director to accept the position of director of development of Wyandotte

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Chemicals Corporation, Wyandotte, Mich. I had charge of research and development for Sharples, and the new position means no radical change in the nature of my work. Some time ago you included in your notes a list of men whose sons were students at Technology and you may wish to note that my boy, Joe, Jr., transferred from Notre Dame in the fall of 1942 and is a candidate for his bachelor's degree in Course X this year. Environment rather than heredity is probably the cause, but regardless of which it is, my daughter is also interested in chemistry. Mary Kay is seventeen and in her first year at Laval University in Quebec, where all of the courses are taught in French."

Arthur G. Wakeman, II, has resigned from the War Production Board according to a note received from Saint, and has returned to the paper industry in his home state of Wisconsin by accepting a position with the Kimberly-Clark Corporation. For the last two years Art has been in Washington as director of the pulp and paper branch of the War Production Board and prior to that he was manager of the Fox River Paper Company, Appleton, Wis. In his new work he will act as co-ordinator of engineering process development and expansion.

John W. Barriger, 3d, XV, has been appointed manager of the diesel locomotive division of Fairbanks, Morse and Company, 600 South Michigan Avenue, Chicago 5, Ill. John has been interested in railroads ever since he served with the Pennsylvania in its maintenance of way and transportation departments. Later he was in charge of the railroad division of the Reconstruction Finance Corporation and left that post to become associated with the Western Carriers' Conference Committee in the 1941 railway wage case. At its conclusion, he returned to Washington as associate director of the Office of Defense Transportation. He was again associated with the Carriers' Committee in the 1943 wage case and then became vice-president of the Union Stock Yard and Transit Company, Chicago. While with the Office of Defense Transportation, John was appointed to serve as reorganization manager of the Chicago and Eastern Illinois Railroad and was a member of its board and executive committee in 1941. He is a director of the Alton Railroad.

S. Paul Johnston, II, is the latest to be heard from in the race among members of the Class to see who can publish the greatest number of books. Paul's recent work, *Wings After War* [reviewed in the "Trend of Affairs" section of this issue. — Ed.] surveys the prospects of aviation after the war in terms of investment, sport, occupation and transport. He is located in Washington with Curtiss-Wright. As a former director of development for the National Advisory Committee for Aeronautics and editor of *Aviation*, Paul is an outstanding authority on aviation. — David O. Woodbury, VI-A, author of the biography of Elihu Thomson, *Beloved Scientist*, reviewed earlier this year [in the "Trend of Affairs" section for March. — Ed.] is now a regular reviewer of books for the *New York Herald Tribune*.

Word has been received from the Institute of the death of two members of Course X, both during the month of July, 1943 — William Clift and Frederick M. Gahagan. Bill made his home in Richmond, Va., and

1921 *Continued*

Fred was president of the Gahagan Construction Corporation of New York. On behalf of the Class, we extend sincere sympathy to their families.

Donald B. McGuire, VI, paused just long enough, when we encountered him in Newark, to say he was visiting power utility people in the area. Don, who is chief engineer of the Rockland Light and Power Company, Middletown, N. Y., still looks so much like the youngster of Cambridge days that we didn't recognize him! This is notice that failure to advise when he is next in town will bring dire results. — Donald J. Swift, X, telephoned to arrange a luncheon date, and a detailed story will have to await a later issue. Don is on a wartime leave of absence from Consolidated Edison of New York and is assigned to special duties which apparently have not seriously affected his golf and bowling. He has a son, Bill, aged ten, and makes his home at 40 Hart Street, Lynbrook, N.Y.

Present at the spring meeting of the M.I.T. Club of Northern New Jersey were: Mor Aronson, Max Burckett, George Chutter, Cac Clarke, Morrie Hart, Sumner Hayward, Fred Kowarsky, Joe Wenick, and Ralph Wetsten. George was elected president, Sumner was made assistant vice-president, Ralph and Fred respectively secretary and treasurer, and Max became a member of the advisory committee. — The month's new addresses include: Donald S. Cheney, X, I, 24 Cavanaugh Road, Wellesley 81, Mass.; Arthur Esner, II, 430 South Oakland Avenue, Pasadena, Calif.; William R. Ferguson, II, Post-office Box 94, Middle River, Baltimore 20, Md. Military personnel have not been included, since mail for men in service will be readressed by Technology.

Again we come to the end of another volume of *The Review*, and there will be a three-month pause until the November issue. In wishing you all a very pleasant summer, we ask two special favors. First, send in your Alumni Fund subscription now and make certain that *The Review* will continue to come your way. Second, send a note with your news to your Assistant Secretary (enclosed with your Fund card or direct, as you will), so that this column can continue to appear. — RAYMOND A. ST. LAURENT, *Secretary*, Rogers Paper Manufacturing Company, Manchester, Conn. CAROLE A. CLARKE, *Assistant Secretary*, Federal Telephone and Radio Corporation, 591 Broad Street, Newark 2, N.J.

1922

Platt C. Benedict has resigned as deputy director of the zinc division of the War Production Board, a position he has held for one year, and has resumed his duties as geologist with the Newmont Mining Corporation, which he left in January, 1943. — Ferris Briggs has become vice-president of the Fen-Mar Company, Inc., at 280 Madison Avenue, New York, N.Y. This company engages in tool and machine design, drafting, general engineering, and the design, layout, and production of technical instruction booklets. It specializes in the latter field, which is particularly important to manufacturers of equipment being furnished to the armed forces. — Our Class President, Brigadier General Browning, was one of the principal speakers at the 29th annual international convention of the

National Association of Purchasing Agents held at the Waldorf-Astoria Hotel in New York on May 29.

It would be interesting to know how many of our Class are associated with the various Army Ordnance districts throughout the country. If readers of this column will send in additional names, we will insert them in future editions. In the New York Ordnance district, we have Charles S. Smith, II, formerly with Babcock and Wilcox, and Charles J. Burke, II, formerly with the Lincoln Oil Company. — CLAYTON D. GROVER, *Secretary*, Whitehead Metal Products Company, Inc., 303 West Tenth Street, New York, N.Y. WHITWORTH FERGUSON, *Assistant Secretary*, Ferguson Electric Construction Company, 204 Oak Street, Buffalo, N.Y.

1923

A note from Professor Locke indicates that Peter V. Martin has been appointed chief of safety for the Carnegie-Illinois Steel Corporation. He has been associated with the company since 1915, when he was a messenger in the Cincinnati sales office. By 1931 he was assistant division superintendent of blast furnaces at the South Chicago Works, having worked his way up from a laborer. Ten years later he was made superintendent of blast furnaces for the company. — Another man who is achieving distinction as a safety expert is Edward R. Schwarz, professor of textile technology at the Institute, and currently president of the Massachusetts Safety Council. Clippings from Boston papers in February and March report service by him as a speaker on safety before various groups in the Boston metropolitan district.

A clipping of last November which has just drifted in reported the appointment by Governor Saltonstall of Richard L. Bowditch as Emergency Solid Fuels Administrator. The clipping recounts that Mr. Bowditch is treasurer of C. H. Sprague and Son Company, a member of Secretary of the Interior Harold L. Ickes' War Resources Council, Solid Fuels Administration, and is chairman of the New England regional advisory committee of the Office of Defense Transportation with reference to the water-borne transportation of coal. — In January the Chicago, Ill., *Calumet* named Wallace R. Dowd, of the United States Navy, as one of the speakers before a forum in South Chicago. Captain Dowd was introduced as supervisor of shipbuilding for the Navy in the Great Lakes region.

Finally, we have two items of vital statistics. Mr. and Mrs. Leroy Benson of Washington announced the marriage of their niece, Charlotte F. Moser, to Harold G. Crowley in March. Major Crowley is reported as having recently returned from an assignment of duty in Brazil, where he met his wife, who was on field service in the city of Manaos for the United States Government's Rubber Development Corporation. Major Crowley's record is also reported on, mentioning his association with the Forbes-Grenfell expedition, a group which accomplished the aerial mapping of the North Labrador Arctic region, and his association with Lieutenant General Doolittle in surveying certain New Guinea areas. — Mary Leona Ellison and Albert Gallatin Thomas were married on March

18 in the chapel of Emory University at Atlanta. — HORATIO L. BOND, *Secretary*, 457 Washington Street, Braintree 84, Mass. JOHN M. KECK, *Assistant Secretary*, 207 Bloomfield Avenue, Bloomfield, N.J.

1925

Here are several items to wind up the volume-year. First, a letter from our Assistant Secretary, Doc Foster, of the Division of Industrial Cooperation at the Institute: "It has been my intention for some time to drop you a line and congratulate you on your new position. . . . I trust things are going well with you and hope the new job is enjoyable. I have picked up a little information regarding men of 1925 which I'll pass on to you. I am enclosing a newspaper clipping regarding Professor Reynolds. Most of us probably remember our good friend K. C. Reynolds as a staff member who gave us excellent instruction in the field of hydraulics. During this period, however, he was doing graduate work in addition to his teaching and obtained his master's degree with our Class."

The clipping referred to informs us that Professor Reynolds, who is on leave of absence from the Institute, has been appointed head of the department of civil engineering at Cooper Union in New York.

Doc Foster continues: "Through Professor Locke I have seen several letters written by George Blonsky during the past few months. The latest report is that he is leaving the Basic Magnesium Company, Boulder City, Nev., and by the time this reaches you he will have returned to Los Angeles and in all likelihood established himself in some new position. The last report did not indicate just what he planned to do, but he had several matters under consideration. A few weeks ago I had a surprise visit from Herb Taylor, Vice-president of the Franklin County Coal Corporation, in Illinois. He was in Boston discussing business matters with some of his stockholders and was able to get together with me a few minutes so that we could sit down and discuss old times. Like everybody else these days, Herb is a very busy fellow with many problems connected with his two large coal properties to keep him on the jump every minute."

An item from the Rochester, N.Y., *Democrat and Chronicle* supplies us with the following information: "Capt. Malcolm F. Schoeffel was nominated by President Roosevelt for promotion to Rear Admiral. He is the first native of Rochester in recent years to achieve that rank. Capt. Schoeffel, 46, in the service of the U. S. Navy for 26 years, is chiefly concerned with naval aviation. He was appointed to the U. S. Naval Academy at Annapolis at the age of 20 and was graduated at the head of his class. He served aboard the SS Leviathan and the USS Kimberly. While on the latter he was awarded the Victory Medal. He served with a destroyer force off Ireland and in 1922 returned to the Naval Academy for a post-graduate course. At that time he also studied at the M.I.T. For a while later he was with the Bureau of Aeronautics in Washington, D.C., and from 1934 to 1935 was staff commander of a flight squadron aboard the USS Ranger, an aircraft carrier. In 1938 he was promoted to Commander and later made a Captain. He is married and has three children."

1925 Continued

From the same paper, in the column called "Our Capital," comes the following: "One of Rochester's fine transplants to this city (Washington) is Dr. Raymond Reuter of Arlington, son of Mr. and Mrs. Charles Reuter of Arnold Park, Rochester. After graduation from the University, he obtained his doctorate degree in chemistry at Massachusetts Tech, and then accepted a position with the Atlantic Refining Co. He married a registered nurse from a Philadelphia suburb, had two children and settled in a home in New Jersey — or thought he was settled, but the Government requisitioned his services and the company gave him leave of absence for the duration. He is serving as chemist for the Petroleum Administration. He has nothing to do with distributing oil to civilians but is working on the construction program of preparing (high) octane gas plants for aviation."

The last item, which is from the Newark, N.J., *Call*, is so interesting technically that I wish we had space to quote it in full. It will be necessary, however, to confine the quotes to the more personal items: "Airline schedules as rigid as those now observed by railways will be the rule in the postwar period, according to Edward N. Wendell of Summit (N.J.), manager of the Aerial Navigation and Direction Finder Divisions of Federal Telephone and Radio Corp. The International Telephone and Telegraph Co., of which Federal is an affiliate, began studies in May 1937 at Indianapolis of existing European systems. Following these experiments production was begun at . . . Newark of instrument landing equipment for the Civil Aeronautics Authority. Under the direction of Wendell, installations and field tests of the equipment were completed in 1939. Wendell has been connected with I. T. & T. affiliates since his graduation from M.I.T. in 1925. Assignments with the company have included direction of construction of overseas radio telephone stations at Madrid, the Canary Islands, the Balearic, and the radio system on the liner Queen Mary. He also directed the engineering phases in the development of the Eiffel Tower television station. As chief engineer for the Spanish Telephone Company he was in Spain during the civil war." — HOLLIS F. WARE, General Secretary, 410 Prospect Street, Wood River, Ill. F. LEROY FOSTER, Assistant Secretary, Room 5-105, M.I.T., Cambridge 39, Mass.

1926

In sallying forth from Cambridge recently on Technology business, the Secretary has found much pleasure in encountering various members of the Class. In Detroit, for example, he met John Longyear, Dave Sutter, and Maurice Ash. John Longyear is president of the Detroit Technology Association, and Dave Sutter is secretary, which makes it something of a '26 organization. John continues with the Detroit Edison Company, Dave Sutter is a manufacturer's agent, and Maurice Ash is in the Army. They gave a most cordial welcome to the traveling Secretary.

Later, in Niagara Falls, likewise at a Technology Club meeting, the Secretary met Walter Crafts, whom he had not seen since 1926. Walter is a research metallurgist with the Union Carbide and Carbon Re-

search Laboratories, Inc. Jay Goldberg calls on the Secretary during his occasional trips to Technology, one of which was for the purpose of being elected a member of the Institute chapter of Sigma Xi. Jay is with the J. P. Stevens and Company and is chairman of the rayon yarn committee of the American Society for Testing Materials. — Arthur Johnson continues his temporary assignment at the Institute in behalf of the Reynolds Metals Company, his employer, and the Secretary has enjoyed having occasional lunches with him. Malcolm Hird, another Course III graduate, now working in Connecticut, is likewise a recent visitor to the Institute.

A clipping from the Bridgeport, Conn., *Post* describes the activities of W. Robert Dresser and his interesting firm, the Audio-Tone Oscillator Company. In addition to working on war contracts, this company is now supplying music to industrial plants to be broadcast in the plants during working hours. Dresser has had quite a career in the radio field. At one time he was a sound-recording supervisor for Paramount Pictures, and later he established a company in Bridgeport for manufacturing graphic recording instruments. Among his inventions are a machine to teach deaf mutes to talk, a talking book for the blind, and "a machine for giving electrical anesthesia." — JAMES R. KILLIAN, JR., General Secretary, Room 3-208, M.I.T., Cambridge 39, Mass.

1927

J. Robert Bonnar has been appointed acting chairman of the bleaching, dyeing, and finishing subcommittee of the textile materials committee of the American Society for Testing Materials. Bob is now technical director of General Dyestuff Corporation and previously held the same position with the American Printing Company. He is also active in American Association of Textile Chemists affairs.

J. E. Tweeddale, until recently on special leave of absence from Bell Telephone Laboratories to Columbia University's war research division, has taken over co-ordination and production programming of thermistors, varistors, glass-sealed switches, and carbon-deposited resistors in the radio division of the Western Electric Company. The new post was created as a result of a greatly increased wartime demand for these products. Since 1942, these devices have been applied with marked success in the solution of numerous manufacturing and engineering problems, particularly those involving ultra-high frequencies. Jack went to Bell Telephone Laboratories in May, 1942, following 14 years of service with Electrical Research Products, Inc., during which he had helped introduce to industry the science of electronic acoustic-vibration analysis, serving as technical consultant to the New York City Tunnel Authority and Port of New York Authority on various tunnel projects, to the New York City Board of Transportation, and to firms engaged in automotive and aircraft manufacture. Following the maiden voyage of the former French liner, *Normandie*, he was called upon to analyze and to make recommendation for the correction of vibration effects which threatened the commercial value of the vessel.

Advancement of Frederick S. Erdman, assistant professor of mechanical engineer-

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ing at Cornell University, to associate professor has been announced by President Edmund E. Day. He has served as an instructor in general science and physics at the American University of Beirut, 1924-25, and as assistant professor of mechanical engineering at Robert College, Turkey, 1928-36. He was appointed instructor of experimental engineering at Cornell University in 1937 and promoted to assistant professor in 1941.

Art Connell's forthcoming wedding has recently been confirmed by the Boston *Post*. The bride-elect is Mary Wilson of Watertown, Mass. Lew Baker was recently married. His address is care of Bigelow, Kent, Willard and Co., 580 Fifth Avenue, New York, N.Y. — The following new addresses have been received: Russell H. Brown, carpenter's mate, third class, care of Mrs. Charles F. Mitchell, 7 Richard Road, Lexington 73, Mass.; Frank C. Hutchison, Apartment 4A, 27 Everett Street, Cambridge 38, Mass.; Captain Hector A. Moineau, Office Chief of Ordnance, Detroit 32, Mich.; Edward D. True, 352 Front Street, Bath, Maine. — JOSEPH S. HARRIS, General Secretary, Aviation Department, Shell Oil Company, 50 West 50th Street, New York 20. DWIGHT C. ARNOLD, Assistant Secretary, Stevens-Arnold Company, Inc., 22 Elkins Street, South Boston 27, Mass.

1929

Brig Allen sends a word as preface to these notes to let the Class know that Fish Hills has taken over the job of seeing to it that 1929 news reaches The Review regularly and that Fish as class news hunter has his official blessing. "I hope," says Brig, "that the fellows will drop him a card and let him know where they are. We have all been more or less scrambled around the past few years. It's no easy task that Fish has undertaken, unless everyone will help by sending him direct word of himself and his friends." — Ed.

Due to the slim pickin's of '29 notes in the last few months, Brig Allen has asked me to see what can be found for news locally. I shall give the job a try, but it will still be slim pickin's if you fellows don't drop me a line telling of your own activities and those of any of the boys whom you are fortunate enough to see from time to time. Brig also reports on the following boys: Ed Axel Yates, a Navy lieutenant, is in Detroit at the Budd Wheel Company. At the time Brig left Washington, Wally Gale was a lieutenant in the Navy. Ted Ewald is currently reported at Cletrac in Cleveland. It seems to me that he reported the birth of a daughter not many months ago, but we can't remember whether or not this is his first and only.

As most of you know, Carl Peterson is now superintendent of buildings and power at the Institute and is doing one swell job of it. Believe you me, that is one large undertaking today. Also at the Institute is Bill Slagle, a lieutenant colonel, who has forsaken the restaurant business to give his full time to the operation of the Chemical Warfare Service's research laboratories.

A rather good '29 delegation at the Alumni Dinner included Blackie Horan, Paul Donahue, Mac Hubbard, Art Marsh, Dan O'Connell, Hunter Rouse, who is now a professor at the University of Iowa, Lee Schnackenberg, Ham Williams, Johnny

1929 Continued

Wilson, who is with Sperry Gyroscope in Brooklyn, Dave Wilson, who is a major at the Watertown Arsenal, Bill Harris, Eric Bianchi, Chuck Worthen, who has transferred from Canada Dry to the James O. Welch Company in Cambridge, Johnny Rich, Carl Crocker, who is in the Cambridge office of Whitehead Metal Products, and Cub Clark, recently attached to D. Van Nostrand, publishers, in New York.

I had a short visit with Charlie Denny and his wife, who were in town while Charlie was trying to straighten out the Navy Department on their switch gear problems. Charlie is still with Barkelew Electric Manufacturing Company in Middletown, Ohio. — A clipping from Salt Lake City reports Ed Tittmann as manager of the Garfield smelter of the American Smelting and Refining Company. Apparently this appointment took place in 1941. From Birmingham, Ala., comes news of the appointment of Larry Luey as comptroller of the Connors Steel Company. — And a late flash from the Alumni Office reports Bill Hutchinson, a lieutenant, junior grade, stationed at Camp Peary, Virginia.

By the by, does anyone hear from or know the location of either Mase Smith or Eddie Ware of the famous team of Smith and Ware? Yours truly has heard neither hide nor hair of either of the boys for lo these past 15 years. — What do you say to some real news in the next issue, which will be dated November? We figure it's awfully hard to scare up news unless each of you will come through with all you have, particularly about yourself. — EARL W. GLEN, General Secretary, 2300 Ridgewood Road, Akron, Ohio. FISHER HILLS, Assistant Secretary, Dewey and Almy Chemical Company, 62 Whittemore Avenue, Cambridge 40, Mass.

1930

George Lawson, VI, is the proud father of his second son and third child, born in April. The engagement of Mary Josephine Cahill of Cambridge to Dan Lucey, II, was announced recently. Dom Hilary Martin, IV, now a Benedictine monk, was in the news recently in connection with the unusual design of ten churches to be built in Missouri at a cost of \$5000 each. We regret to announce the death of Leonard Ellis, III, in Toronto on January 30. Our sympathy goes to his widow. Bob Henderson, III, is now assistant superintendent of the big Climax mine in Colorado, according to Enoch Greene, XII. The latter is now expediting aircraft motors and has promised to send a résumé of his own activities since we left the Institute. Starting his letter with the classic remark that it seemed to him that the 1930 news needed a little jacking up, Harold Spaans, XV, did some jacking. His interesting account of his active military career starts with an instructorship at Fort Monroe, Va., thence to the antiaircraft school at Camp Davis, N.C., where he is presently located as a lieutenant colonel. His family lives near by in Wilmington. John Parmakian, II, also a lieutenant colonel, was one of his students in 1941. Classmates visiting Camp Davis are cordially invited to say hello. Your Secretary is anxious to receive similar letters from you other boys in the service to give this column additional interest.

During the summer months the Alumni Fund will also be glad to hear from you. This past year we came out ahead of both '29 and '31. This time let's be in there ahead of '28 at the finish. It will be some job, and it is up to all of us. Best wishes until fall! — PARKER H. STARRATT, General Secretary, 1 Bradley Park Drive, Hingham, Mass.

1931

From the battle front we hear that Captain O. Glenn Goodhand has been awarded the Silver Star for gallantry in action on the Anzio beachhead. Glenn's duties there involved observation from the air of enemy installations and directing of fire of Allied field artillery guns. Before entering the service in July of 1942, Glenn was employed at the Eastman Kodak Company in Rochester. — At a winter session of the Army Ordnance Association held at the Waldorf-Astoria in New York City, Gordon S. Brown took part as one of the discussion leaders on ordnance production, engineering, field service, and military training.

James A. Wilson has been promoted to plant manager of the Monsanto Chemical Company plant at Trenton, Mich. He has been assistant plant manager of the Trenton plant since September, 1942. On leaving the Institute Mr. Wilson joined the Swann Chemical Corporation, predecessor of Monsanto, starting as a research chemist in Anniston, Ala., in July, 1931. He served in the research department until February, 1936, when he was transferred to the operating department as supervisor of sodium phosphates. In 1939 he was made assistant plant manager at Monsanto's Carondelet plant in Missouri and served in that position until his transfer to Trenton.

Professor Charles E. Locke has passed along the following two memoranda: A. J. Breitenstein is now chief of engineering of the H. C. Frick Coke Company. He was formerly assistant chief engineer of the company, which he joined in 1941. Marvin P. Egleston has been transferred from Salt Lake City to Magna, Utah, where he is assistant chemist of the central power station of the Utah Copper Company.

During the brief time I have lived in Winchester, from May 1 when I moved there to May 27 when this column is being written, I have run across two fellow townsmen who are '31 men. Johnny McNiff is a captain in the Ordnance Department and has recently been assigned as authorized representative of the Ordnance Department at the Lowell Ordnance plant (No. 2, South) at Lowell. Johnny and Mrs. McNiff and their two children, ages six months and two and a half years, are living at 53 Ledyard Road, Winchester. Don Loomis is also a fellow townsman, he and Mrs. Loomis making their home at 38 Farrow Street. Don has been in the Navy for three years and is now a lieutenant commander stationed at the Boston Navy Yard. — BENJAMIN W. STEVERMAN, General Secretary, 11 Orient Street, Winchester, Mass.

1934

A recent article describing how the knowledge gained by the members of Admiral Byrd's expedition is playing an important part in certain phases of the war

included the name of one of our classmates. Ernest E. Lockhart was mentioned as contributing technical experience on cold-weather diets for our troops fighting in the frozen North. — Julian Dorr has received a commission in the Naval Reserve as lieutenant, junior grade.

It is with deep regret that we announce the death of Justus U. Steele. He was killed last April in a plane crash somewhere near Seattle, Wash. Lieutenant Commander Steele entered training as a flying cadet at Pensacola, Fla., in 1937. Before the war he was attached to the light cruiser *Brooklyn*. Since Pearl Harbor he has seen service in both the Atlantic and Pacific war theaters. He leaves behind his widow, Mrs. Barbara Steele.

Our congratulations to Rufus A. Soule, a lieutenant commander in the United States Naval Reserve, who was awarded the Legion of Merit medal for "exceptionally meritorious conduct in the performance of outstanding services as commanding officer of a destroyer escort during the advance landings in the Anzio-Nettuno area, Italy, in January, 1944. . . . Lieutenant Commander Soule carried out patrol operations with great initiative and professional skill within the transport areas to give effective protection against hostile aircraft attacking shipping in the assault anchorages. He directed unremittingly and frequently under enemy bombing and gunfire, numerous outstanding anti-aircraft engagements and skillfully applied the equipment and batteries under his command to repel enemy bombing attacks which would have, in all probability, inflicted serious damage on crowded shipping off the landing beaches. This hazardous and exacting task required the presence of his ship in the immediate target area continually for three weeks and the efficient accomplishment of this assignment was undoubtedly a factor in the success of our landings and in our ability to maintain the invasion forces on the Anzio beachhead by seaborne traffic. The extraordinary ability, great courage, and outstanding devotion to duty displayed by Lieutenant Commander Soule reflected great credit upon himself and the Naval Reserve." The citation was signed by H. K. Hewitt. Commander Soule's wife and two children are living in Newton. While in Worcester, they lived at 168 Mayfield Street."

Raymond B. Montgomery walked altarward on April 22 with Mary Eleanor Perkins, daughter of Mr. and Mrs. Edward N. Perkins of East 68th Street, New York. Raymond has been associate professor of meteorology at New York University and is now at the Institute. — Frank Brazel has also joined the ranks of the benedicts. His wife is the former Gretchen Heins, daughter of Mr. and Mrs. Elmore D. Heins of Roanoke, Va. The wedding took place on March 4, in Roanoke, Va. Frank is practicing architecture in Norwalk. — Howard Reichart is engaged to be married to Elisabeth E. Frost, daughter of Ellinwood A. Frost and the late Mrs. Frost of Morristown, N.J. No date was given for the wedding. Howie is now working for Carbide and Carbon Chemicals Corporation in New York.

Well, fellows, you have the whole summer in which to write one letter — so how about breaking down and scrawling off a

1934 Continued

few lines to your Secretary? — JOHN G. CALLAN, JR., *General Secretary*, 184 Ames Street, Sharon, Mass. ROBERT C. BECKER, *Assistant Secretary*, 169-4924 Avenue, Flushing, N.Y.

1937

Al Haskell has at last stepped off on this road of matrimony, taking the final plunge on April 1. The wedding was in Cleveland, Ohio, and Mrs. Haskell was Nancy Schwarz of Harrisburg, Pa. The grapevine has it that they will live in South Orange, N.J. Is that correct, Al? Walt Blake also sent word of his marriage to Susan Stoll at Aberdeen Proving Ground, Md., on April 19. It is understood from reliable sources that the bride and groom received a 21-gun salute (if you picked out the correct 21). Major Blake — get that "Major"? It's getting so that if a fellow from this Class isn't a major or a colonel, he wears dark glasses and a mustache as he sneaks about on his daily duties — anyway I assume that Major and Mrs. Blake will live in Aberdeen.

At the honors night dinner of the Institute of the Aeronautical Sciences at the Waldorf-Astoria on January 24, William Bergen was presented with the Lawrence Sperry Award for 1943 in recognition of his notable contribution to the advancement of aeronautics in the form of a paper entitled "Theoretical and Experimental Studies of Dynamic Loads on Airplanes." He is chief flight test pilot of the Glenn L. Martin Company in Baltimore.

Last week I was in Cincinnati and while there telephoned Bob Fischel (another major), who joined us at the Netherland Plaza for dinner and a gabfest with gaiety afterward. We had a most enjoyable evening, during which he told me in strictest secrecy that Norm Robbins was planning to be married during the latter part of May. There goes that secret (but when I got home there was a letter from another friend of the family telling the same thing and saying not one word about secrecy). So by the time you read this there will probably be a Mrs. Norman B. Robbins. Bob was in fine health and still bubbling with enthusiasm to get into the thick of things. He was telling that he expects to be located in Dover, Del., soon and will welcome one and all from east, west, north, or south to visit him. We shall hope to see more of him in New Jersey from then on.

I'll be back with you again in the Fall, so keep your ears pinned back and your eyes peeled to give me all the latest for this column. — WINTHROP A. JOHNS, *General Secretary*, 34 Mali Drive, North Plainfield, N.J. PHILIP H. PETERS, *Assistant Secretary*, 159 Glen Road, Wellesley Farms, 82, Mass.

1938

We have received from Harry Hollander an announcement of the arrival of Laurie Lee, born on March 23. We're not absolutely sure, but we think it must be a girl, and if the baby is like the announcement, she must be a pretty nice one. — Abbott Byfield's wife had a baby boy on May 16. His name is Peter. It was quite a coincidence that Peter was born on the fourth birthday of their other child, David. Both mother and son are doing well. Ab is living in Lexington, Mass., and has been with the National Defense Research Committee

at the Institute for two years and is about to depart for overseas duty in connection with the work he has been doing.

Up in Portland, Maine, last week we saw Archie Main. He is in charge of the engineering work in the drafting room and mold loft at the New England Shipbuilding Corporation, and he is also doing very well at home — he's married and has two nice girls, one about 2 years and one only a few months old. — Our gay gallivanner, Dick Muther, has finally found the right one; his engagement to Barbara Brown was announced last week. He is still with the Navy and stationed in Washington, taking what little time he does have to come to Boston to see Barbara.

Our classmates, to the number of 248, are serving in the armed forces of the United Nations. We have 180 men in the United States Army, 64 in the Navy, 3 in the Marine Corps, and one with an allied force. One man has won the Air Medal — Lieutenant John Guttell. Two have won the Legion of Merit — Major Leland Cagwin and Captain Charlie Mills. Another has won the Purple Heart — Lieutenant Bob Flanagan. Five men have given their lives for our country in this war: in the Navy, Ensign Arthur L. Dionne and Lieutenant Fred L. Lamb; in the Army, Lieutenant John H. Eakin, Captain Charles R. Mills, and Corporal James M. Topalian. We think this admirable record speaks for itself.

These will be the last class notes until fall. We hope that during the summer more of you will take time off to write a letter to your Secretary so that your classmates may know more of your doings. — DALE F. MORGAN, *General Secretary*, Carbide and Carbon Chemicals Corporation, 3Q East 42d Street, New York, N.Y. ALBERT O. WILSON, JR., *Assistant Secretary*, 32 Bertwell Road, Lexington 73, Mass.

1940

Bonner Hoffmann writes that he is still with the Teletype Corporation, having been with them since leaving the United States Rubber Company a little over a year ago. According to him, he is still unmarried and still happy, playing basketball each year as the season rolls around, and getting in some touch football during the fall. He admits that he is getting old, but still has lots of pep. Bonner was appointed representative for the Class on the executive committee of the Technology Club of Chicago. He tells of several of the fellows whom he saw at the dinner given for Dr. Compton a few months ago. "Norm Klivans is a captain and instructor in the Army Air Force meteorological training program at the University of Chicago. [Note: This column gives up trying to keep track of that guy Klivans; every time we locate him, as in The Review for March, we hear from other sources that he's gone off on another trip. This time it is Chicago — when we just had him settled with an A.P.O. number somewhere south of the equator.] Dick Hammerstrom has recently moved out here with his wife and infant and is living on an acre of land which he has converted into a truck garden. He is working for the United States Public Health Service. — Ed Lemanski is working in a laboratory at the University of Chicago. — Joe Greenberg is working for Perfection Gear. — Bob Deutch is now a sales engineer for the

Shell Oil Company. — George Yamashiro wasn't able to make the dinner, but they told me he is teaching Japanese to the Army boys at the University of Chicago. — Willard Morrison is in Wisconsin working for the West Bend Aluminum Company. He was able to make the dinner, but wrote a letter explaining that West Bend was a little too far."

Erling O. J. Helland was an accountant with Arthur Andersen and Company of New York until October of last year. He is now an ensign in the Naval Reserve stationed at Princeton, N.J. The Helland's have one son, Eric, born in October, 1942. — John B. Scalzi was teaching such subjects as aerodynamics and structures for Cornell University, but for the past two years he has been with the Engineering Science and Management War Training Program working in the engineering department of Curtiss-Wright's Buffalo plant. The Scalzi's have one daughter, Joan Elizabeth. — Robert A. Bittenbender is still doing structural work also in the engineering department of Curtiss-Wright at Buffalo. Bob and Sally became proud parents of a little girl, Sandra Southworth, last November. — The former Ida Rovno '39, now Mrs. Joseph Blackman '40, and her husband became parents of a son, Michael, in March of this year.

Harold Hawes, an Army lieutenant, was recently married to Helen Hall Paine in Beverly Hills, Calif. — John Hancock Keefe and Kathleen Anne Toomey were married in Dorchester in April. Malcolm McKeag '39 was best man at the ceremony. — Jane Marie Brennan became the bride of Thomas E. Sullivan recently. Dr. Sullivan received his Sc.D. in Chemical Engineering as a member of our Class. — Manette Lansing Hollingsworth became the bride of Robert Dixon Speas in March. — Esther George and Ralph A. Bloomsburg were married in March also, at Christ Church in Cambridge. Ensign Bloomsburg is temporarily stationed at the Institute as an instructor in electronics.

Kingsbury Jackson, now a captain and a chemical officer, recently reports in a brief V-mail letter that although England in the spring deserves all that has been written about it, he still would prefer to be in Cambridge, even on a winter day. While waiting he sends regards to his Course X friends. — Harlan H. Davis, after leaving the propeller division of Remington Rand, Inc., in Johnson City, N.Y., became senior design engineer for the Minneapolis-Honeywell Regulator Company, aero division, in Chicago. On March 25 he was commissioned an ensign, Ordnance Volunteer (Specialist) in the Naval Reserve. He has now completed his indoctrination course at Fort Schuyler. This bit of news brings up to date the report on Harlan in May.

Ollie Fulton visited the Institute on a recent business trip made in connection with his job at R.C.A. in Harrison, N.J. He is living in Montclair with Jack Gray and eight other bachelors. — Dick Babish has returned to Technology to work in the radiation laboratory after a job which took him to Florida and Hawaii for extended periods. He has been a field engineer for the Vitarama Corporation, where he was responsible for field installations and maintenance of equipment used in training aerial gunners.

1940 Continued

Henry Anderson, Jr., was married to Marie Woodall of Schenectady in March. He is with the General Electric Company. — Reeve and Jane Morehouse report the birth of a son, James Holly. Reeve, a lieutenant in the Navy, is with the special devices section of the Bureau of Aeronautics. Rafael Martinez is an ensign also with the special devices section in Washington. — H. GARRETT WRIGHT, *General Secretary*, 1040 Lombard Street, San Francisco 9, Calif. THOMAS F. CREAMER, *Assistant Secretary*, Apartment 436, 2032 Belmont Road, Northwest, Washington, D.C. JOHN L. DANFORTH, *Acting Assistant Secretary*, Room 24-222, M.I.T., Cambridge 39, Mass.

1941

We can but wonder at having received a delayed Easter greeting from the Anzio beachhead, where it seems that there are more M.I.T. men than enemy. Captain John Stadig was the instigator, and joining him in the signature were Ed Owen, Hank Avery, Stan Smolensky, John Verrochi '42, Bill Verrochi '43, Bud O'Connor '42, Bill Vincent '39, and Art Cook '39. I don't doubt but that others are in the area but just haven't got together.

Walt Willey is now putting a "lieutenant" in front of his name, as is Davis Dewey, thus indicating the continued trend towards the armed services by '41 men. Larry Turnock, located down in Baltimore, has received another silver bar, and Beaver now answers when you call him captain. Other men to get another bar: Bill Hooper was last heard of as having an A.P.O. address out of New Orleans, and Charley King as located up in the chem labs at the Institute. Ed Eve, Jr., went up to lieutenant commander, as did John Ballinger. Lieutenant Ed Marden, last heard from up at Greenland, is still listing the New York A.P.O. Fred Whitaker, a captain in the Field Artillery, is down at Shelby, and Lieutenant Conrad Nelson, at Columbus, Miss. Clif Moffer just received his full lieutenancy in the Navy, while Ray Koch, an Army captain, is out at Command and General Staff School. East Coast A.P.O. lists include Bill Sheard, Charley Cole, George Bises; West Coast, John MacLeod. Gene Crawford, supporting two stripes for the Navy, is out in Oregon.

We received a note from Wallie Ross of widespread Technology Christian Association fame, enclosing a clipping covering the T.C.A. blood drive. In addition to showing a good picture of Wallie and Connie Houghton, the clipping indicated that the versatile T.C.A. has found an easy and painless way of giving blood. If you haven't already, you ought to send a contribution to said organization; it needs our support right now, as much as ever.

We have a swell letter here from Mrs. John Hermistone telling of John's promotion to first lieutenant. John had been stationed on the Institute grounds some time back but is now piloting a Martin Marauder somewhere in England. Another letter, from Ivor Collins, a lieutenant, junior grade, in the South Pacific, tells of being busy turning out bundles for Tojo. As for news from other members of the Class says Ivor, mighty slim. "I haven't met a soul that I know, '41 or otherwise. The last word from Carl Aronsen was two

months ago. Lad Lim is still in China, but not making much headway with the women there. A letter from Tony Fiorentini says he's living in Randolph, Mass., married and turning gentleman farmer. As for me, although many of the Aussie girls are very attractive, I'm still on the bachelors' roll of honor."

We visited Major Clark, known as just George during track team days, and found that Oscar Hedlund and the New England Intercollegiate Champion M.I.T. track team were to visit Philadelphia for the Intercollegiate Association's meet. We hustled over to the Sylvania the night before the meet and spent an evening talking over old times. Les Corsa, a private, first class, at Harvard Medical School, came down for the meet and made the old track club spirit mighty realistic. Our Class is certainly spread out nowadays.

Mert Richardson, a captain in the Army, wrote in from the Subsistence Research and Development Laboratories in Chicago, having just returned from two months of testing rations under cold-weather conditions in Prince Albert, Saskatchewan. "Temperatures went as low as 38 below although the average temperature was around zero." Mert speaks well of living in Chicago but is still suffering from writer's cramp, as he calls it. Your Secretary might add that his case is but mild compared to others we know.

On the marital front we hear of the marriage of Hannah Freedland to K. P. Seltzer. Eleanor Stephens, a lieutenant in the Army Nurse Corps, was married to Lieutenant Irv Foote on March 25 at Schofield Barracks, Hawaii. Stella Tanner is engaged to William Burton who came to the Institute from Hampden-Sydney College. A Navy press release tells us that Dick Markey, a lieutenant in the Navy, was graduated from the airship flight training school at Lakehurst naval lighter-than-air training and operating base. "Designated as a naval airship aviator, he was assigned to a blimp squadron for antisubmarine patrol duty after graduation exercises."

We received an excerpt of a letter dated April 25 from Bob Meier of Detroit to Ralph Jope: "It is with deep regret that I inform you that word has been received that Major George Weinbrenner '41 has been missing in action since February 22. George had been in England for nearly two years but had only recently been going on raids over Germany, whence he is missing." We certainly hope for the best in regard to George. — Bad news was received from Attleboro, Mass., from the brother of Charnley K. Atwater. Kemp, an army lieutenant, was killed in action on March 19. He was with us at the Institute during our freshman and sophomore years and was well known to Course XV men. Kemp left Technology after the second year and transferred to Brown University, whence he graduated in '41. We had occasion to see him at odd times during his studies at Brown and thought very highly of him. Our most sincere condolences are extended to the Atwater family.

A long letter came to us on May 10 which made us regret for a moment that we ever had to do with writing a column for The Review during wartime. Johnny Nagle, a captain in the Army, was killed in action at Gusap, New Guinea, we learned from

his mother, Mrs. John Nagle, Jr. "John was commissioned on October 2, 1941, a second lieutenant in Coast Artillery. His antiaircraft guns were mounted in merchant ships, and in January 1942 he sailed to Australia with supplies and troops to establish a base in New Caledonia. He returned in April, 1942, and immediately sailed to Ireland and England, with supplies and troops; then from England, down around South Africa to Egypt, Arabia, and Libya. He returned in September, 1942, and spent the next few months training troops in Virginia, North Carolina, and Georgia. In February, 1943, he joined the Airborne Command, and trained his machine-gun battery until they finally sailed in September, 1943, for Australia. He became a captain on May 30, 1943, and had been in New Guinea since last November. The telegram from Washington read that he had died on April 29, as a result of drowning. We presume that his plane was shot down into the sea."

Your Secretary knew John Nagle well while at the Institute, attending with him the same course for the entire period and competing on the same team for four years. A more clean-cut, capable, modest individual than he was not to be found in our Class. Many of our classmates have met with death on the battle fronts during the past two years, and it has been impossible for your Secretary to pay adequate tribute to all, not knowing all members of the Class. We wish we had known each man who has been lost well enough to give him the tribute due and to express to his parents the personal condolence which we extend to the family of Johnny Nagle. — STANLEY BACKER, *General Secretary*, 46 Bicknell Street, Dorchester 21, Mass. JOHAN M. ANDERSEN, *Assistant Secretary*, 136 Beacon Street, Boston 16, Mass.

1942

So here it is July again, with the last bit of news for a spell and a call for help from your Secretaries for a little fuel in the next week or two to start with in the fall. Many thanks to those who have been good enough to write now and then, receiving belated replies if any, from us. As for the rest, it's about time to hear about those new branches on the family tree, the statistics on the *status quo* of bachelors, and the doings and whereabouts of each and all.

Topping off the list of the uniformed here and there is Janet Norris, IV, now Ensign Norris, stationed at Washington, D.C. (How's that informal class chapter doing there?) who hits a double headline, announcing her engagement to Oliver A. Starcke, also an ensign in the Naval Reserve, one of the electronics specialists who received part of his training at the Institute. Ensign John Markell recently acquired Navy wings and a gold stripe on his sleeve from Corpus Christi, Texas. Charles Strohmeyer, Jr., formerly marine engineer with Tampa Shipbuilding Company, has been commissioned an ensign, and is probably in training now in preparation for active sea duty. Lieutenant Bob Vyverberg was recently at home in Rochester on leave after several submarine war patrols in the Pacific. Max Woodbury may now be officially addressed as captain; he received his promotion at an air base in North Africa,

1942 Continued

having been a "metro" officer in that theater, we hear, since October, 1943.

For those who have seen "Memphis Belle" a familiar face looms on the screen once or twice as Colonel Wray, group commander — better remembered as a ground forces silver-barred lieutenant, and coach of the "Novars." Lieutenant Jackson Wells is busy these days driving P-38s in the Italian theater. From George Granitsas, III, a first lieutenant "somewhere in England," comes word that he has bumped into several men from the Institute, some from Course V, in the Chemical Warfare Service, and Jim Stern of Course III. At last word George was commanding a medium automotive maintenance company, with the duty of keeping the wheels of the Army rolling. He says he has learned a lot about internal combustion engines and especially how many unorthodox methods have to be used under war emergencies to keep the vehicles going. Welding equipment is in constant use.

A pause in the notes for a few words of sadness: Lieutenant Dave Stamper, II, a Sigma Nu and former mainstay of *Voo Doo*, lost his life on May 16 while flying his Corsair for the Marines near Lee Field, Green Cove Springs, Fla. A \$50,000 Memorial Scholarship Fund was set up for Dave at Moberly Junior College, which he attended before going to the Institute. Black-haired Dave and his fire-engine red Buick are vivid memories of the Brookline lads and of most '42 men.

From Herb Twaddle, an ensign, care of the Fleet Post Office, comes word that Warren Twaddle is also abroad, doing motor maintenance work with the Army Ordnance. For a change, comes word of a few of the swing-shifters and other "long-hourers" still plugging away on the home front. Russ Thompson, X, is a control man with Standard Oil at Baton Rouge. According to Herb Twaddle, he is thinking seriously of wearing the Navy's choicest clothes. John R. Clark, formerly instructor at Stanford University, is now to be found at the University of Chicago metallurgical laboratory. Paul Walton recently left the Texas Company, for whom he was geologist working in Colorado and Montana with Denver for "home base," to become division geologist in the Rocky Mountain area for the Pacific Western, George F. Getty, and Skelly Oil interests. He is in charge of the exploration activity of the joint venture in that area, which is right on the front line of our oil program.

As always, and especially in June, the bachelors have increased their moaning at the bar, but with fewer and fewer voices. Frank Conant, a lieutenant in the Marine Corps Reserve, and Jean Hadley announced intentions in March. Frank is at the Marine Air Station, Cherry Point, N.C. (Still flying A-20's?) Hank Titzler, a lieutenant in the Army Air Force, stationed at California Institute of Technology, became engaged to Muriel Scott on April 6, and at the last word June 24 was to be the big day. George Estes '39, and perhaps other Alumni, expected to be there for the ceremony. Pete Sibley, in the Air Transport Command, and Dorothy Farrar were married on April 22.

Nils Loven, a lieutenant, junior grade, and Lillian Knorr were married in Bridge-

port, Conn., Frank Powers and Frederick Grant being ushers. Frank McClintock and Mary Whitmore, an assistant at the Center of Analysis at Technology, announced their engagement some months ago. Frank received his master's degree also at the Institute in 1943, and is a research engineer with United Aircraft in Hartford. Mrs. Jerry Coe was an honor attendant at the wedding of Henry Anderson and Marie Woodall in Schenectady. Alex Hancock, a naval architect and lieutenant, junior grade, at Philadelphia Navy Yard, set up housekeeping with Marjorie Middleton early in March. Bob Gage and Rosalind Schang, engaged in April, are planning a June wedding, probably with some Phi Beta Epsilon cohorts for moral support of the groom. Dick Gould, a naval architect at the Boston Navy Yard, and Miriam Kowalski announced their engagement also. Peter Smolka, also holder of a master's degree from the Institute, and Marjorie Timmins are planning a future together, it was announced in March.

And so we close, with your Secretary field still fighting the campaign of the Southwest, but not for long, it seems. So — Karl our noble Class Agent, would, I know, welcome a helping hand with these notes (actually it takes many to keep them newsy and interesting), and a note to the address below from someone interested in helping to compile this monthly effort would be appreciated. Let's keep this an every-month class, and make this the best class notes section of all! — FREDERICK W. BAUMANN, JR., General Secretary, Orchard Lane, Golf, Ill. KARL E. WENK, JR., Assistant Secretary, Room 2-229, M.I.T., Cambridge 39, Mass.

1943

I have recently returned to Aberdeen after a few days' leave. While at the Institute I ran into Charlie Holt, who says it won't be long now, for he is classified 1-A in the draft. George Schudel is still there and seems to enjoy life. In New York, I ran into Lou Schwartz, who is a lieutenant in the Signal Corps, at present stationed in Detroit. He tells me life is fine, but he does not see many of the boys.

News is at hand of Curt Smith who transferred from here a few weeks ago and is now a lieutenant in the Coast Artillery. He has the following to recount: "This assignment is very good. . . . We fire our weapons down the coast. The impact is about a mile off the beach of a shore resort. Saturday the chief of police telephoned that the citizens were complaining. We had to hold up fire for an hour in order to explain to the bathers that they were not in danger. Some of our boys, including me, have terrible sunburns. I'm afraid I shan't be able to play softball with the officers tomorrow. They have a team in the fort tournament."

Charlie Crocker, a lieutenant in Ordnance, is now in London, and from Rochester, N.Y., I hear that Raymond Dunn is also in England. He is doing considerable traveling while inspecting fire control equipment and is commanding officer of an Ordnance company.

Bernard Dale is on the West Coast. I quote some of his letter: "I am now a junior research engineer with Shell Develop-

ment Company, being located in the pilot plant at Wilmington, Calif. The town is in the harbor district some twenty miles from Los Angeles. Our schedule calls for graveyard work one week, swing the next, and days the third. I heard quite frequently from Bill O'Neill, who was graduated from Camp Davis Officer Candidate School. He spent Christmas in Lawson General Hospital in Atlanta, Ga., having a kidney operation. I suppose he is back in old form now. (Bill was discharged from the army a few months ago, but since then I have not heard from him.) Bob Bamford, also a lieutenant, spends his time repairing army equipment at Flora, Miss. He is lazy, however, about answering letters, so this information comes from his mother. Ted Thomas is at the American Cyanamid plant in Stamford, Conn."

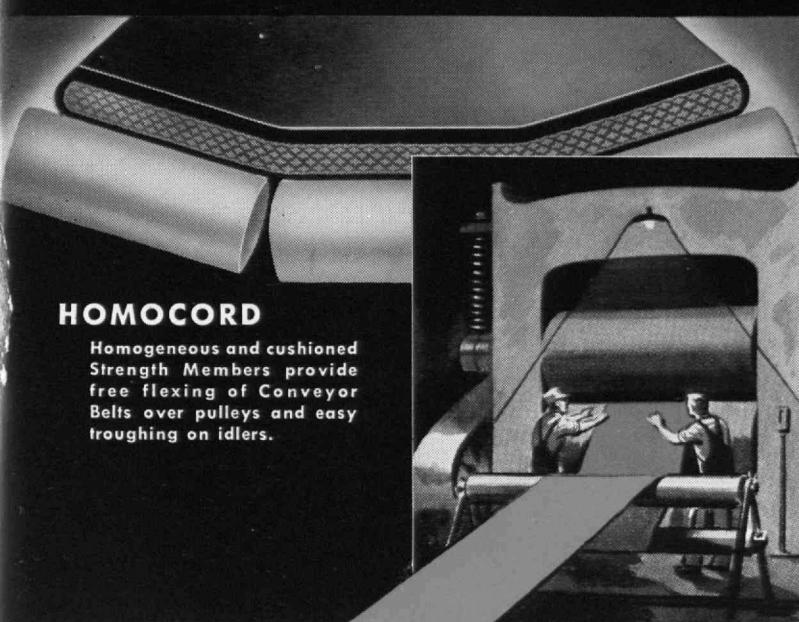
Herb Twaddle, an ensign in the Navy, has very little to say to us, but I quote his cryptic remarks anyway. "I am out here in the Pacific on a secret project. My tongue is tied — they won't let me say a thing!" We hear the Shou-Ngo Tu is working in Buffalo, N.Y., and is a member of the chapter of the Chinese Institute of Engineers there. Alejandro Bastante, a commander in the Peruvian Navy, is still studying at the Institute.

From San Marco, Texas, I have heard that Marvin Stephens is now wearing the wings of an aerial navigator and has also recently donned the bars of a second lieutenant. Of Andrew Bartuchok, who is another aviator, comes the following news. He is now an aviation cadet in the Naval Reserve, stationed at the Navy pre-flight school, Chapel Hill, N.C. He left Technology before graduation to work for Professor Fernstrom and the North Carolina Shipbuilding Company. He spent two years there in the welding department, gaining experience on the relatively new "union-melt" process of electric welding. Last summer he enlisted in the Navy as an aviation cadet, going first for preparatory training to Wesleyan University in Connecticut, where he studied navigation, among other things. After three months there he was sent to Keene Teachers College in New Hampshire, where he learned to fly a Piper Cub. From Keene he was transferred to the University of North Carolina, where he is now undergoing a very intensive physical training program at the same time that he is receiving the officers' indoctrination course.

The matrimonial department has word that Lieutenant Reuel Curtis and Evelyn Barksdale are now husband and wife and that the former Marjorie Trench is now Mrs. John Lipford. Engagements have been announced for Rhoda Arons and Elliott Levinthal, for Betty Hale and Lieutenant Edward McLaughlin, and for Mary Arbeene and Lieutenant Arthur Mabbett.

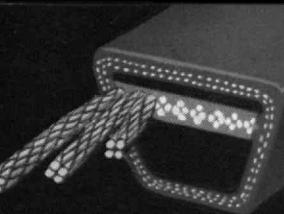
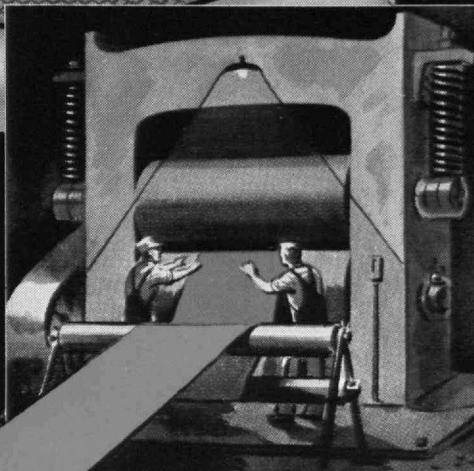
This is the last opportunity I shall have to record the wanderings of the Class until next fall. Have a good summer, but remember I still have a mailbox vastly too large for my incoming mail, so keep the news rolling in by dropping me a line at not too infrequent intervals. So long, until November. — CLINTON C. KEMP, General Secretary, Barrington Court, 988 Memorial Drive, Cambridge 38, Mass.

MANHATTAN



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CONDOR V-BELTS

Whipcord construction gives flexibility, strength and extreme lack of stretch.

STRENGTH MEMBERS

... are the SINews of FLEXLASTIC^{*} Rubber Muscles



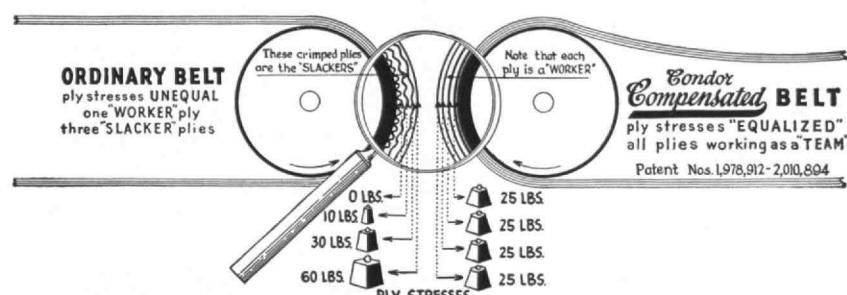
Conveyor and Elevator Belt	Suction Hose
Compensated Belt	Water Hose
Transmission Belt	Chute Lining
V-Belt	Launder Lining
Air Hose	Industrial Brake Blocks and Lining
Contractors Hose	Molded Rubber Goods
Fire Hose	Rubber Lined Tanks
Hydraulic Hose	Rubber Covered Rolls
Oil and Gasoline Hose	Abrasives Wheels
Sand Blast Hose	Bowling Balls
Steam Hose	

Just as the sinews hold together and strengthen the muscles without limiting their freedom of movement, so MANHATTAN STRENGTH MEMBERS reinforce and strengthen the FLEXLASTICS*, at the same time that they enhance their flexibility and durability.

MANHATTAN STRENGTH MEMBERS are "engineered," each one for a specific service, fabricated and scientifically located in the precise area or section where they contribute the most to structural life and capacity—just as in engineering design of bridges or trusses. Members of suitable materials, correctly proportioned and treated, are properly placed with respect to all other component parts.

Examination of the diagram below of ordinary and Condor Compensated Belt illustrates clearly what correctly designed strength members accomplish in performance, longer life and notably lower ultimate cost of power transmission. It is an economy which extends beyond the belt itself, to bearing and machine and to uninterrupted production.

Similar advantages result from a long line of exclusive MANHATTAN developments, such as the Homocord principle for Conveyor Belts; Condor Whipcord Endless Belts with Extensible Tips; Condor Whipcord V-Belts; Homoflex Hose in air, water, spray and other types; MANHATTAN Fire Hose with Radio-Active Mildew-Proof Treated Jackets, and many others.



*The term FLEXLASTICS is a MANHATTAN Trade Mark. Only MANHATTAN can make FLEXLASTICS.

51st YEAR OF RESEARCH

The record of the first 50 years of accomplishment is the pledge for the second half-century. MANHATTAN is now entering with research, testing, care and inspection as a basic policy, so there may be unbroken continuity to its contribution to industry. It will always be sound policy to keep ahead with MANHATTAN.

KEEP AHEAD WITH



THE MANHATTAN RUBBER MANUFACTURING DIVISION
of RAYBESTOS-MANHATTAN, INC.

EXECUTIVE OFFICES

PASSAIC, NEW JERSEY

WRITE FOR FREE WALL SIZE COPY OF THIS REACTANCE CHART

Always use corresponding scales

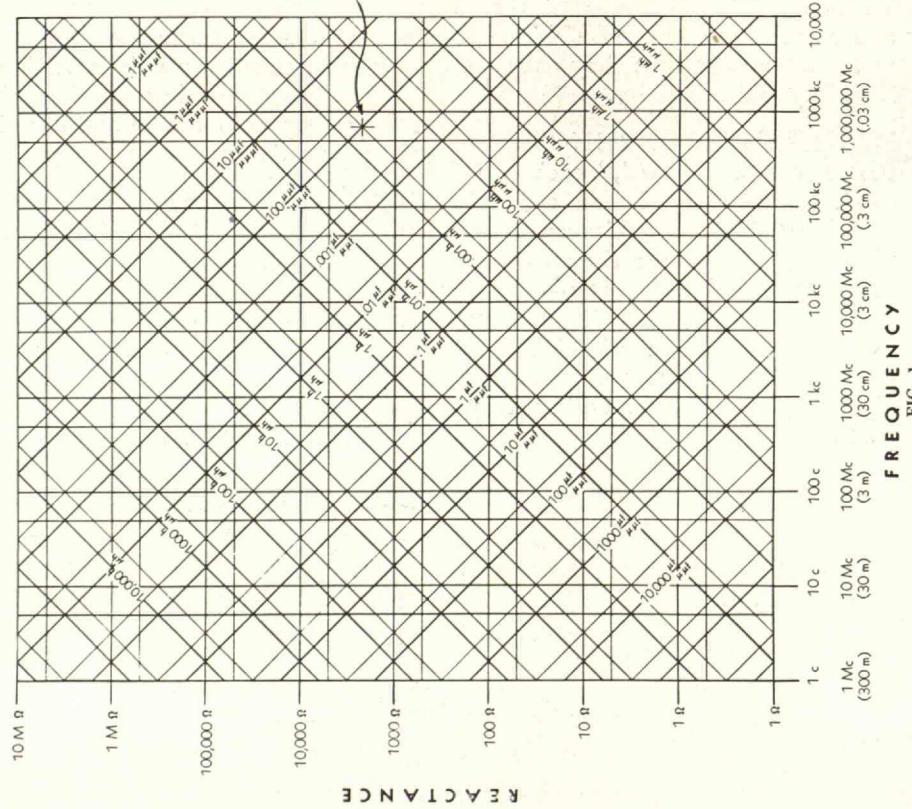


FIG. 1

The accompanying chart may be used to find:

- (1) The reactance of a given inductance at a given frequency.
 - (2) The reactance of a given capacitance at a given frequency.
 - (3) The resonant frequency of a given inductance and capacitance.
- In order to facilitate the determination of magnitude of the quantities involved to two or three significant figures the chart is divided into two parts. Figure 1 is the complete chart to be used for rough calculations.

Always obtain approximate value from Figure 1 before using Figure 2

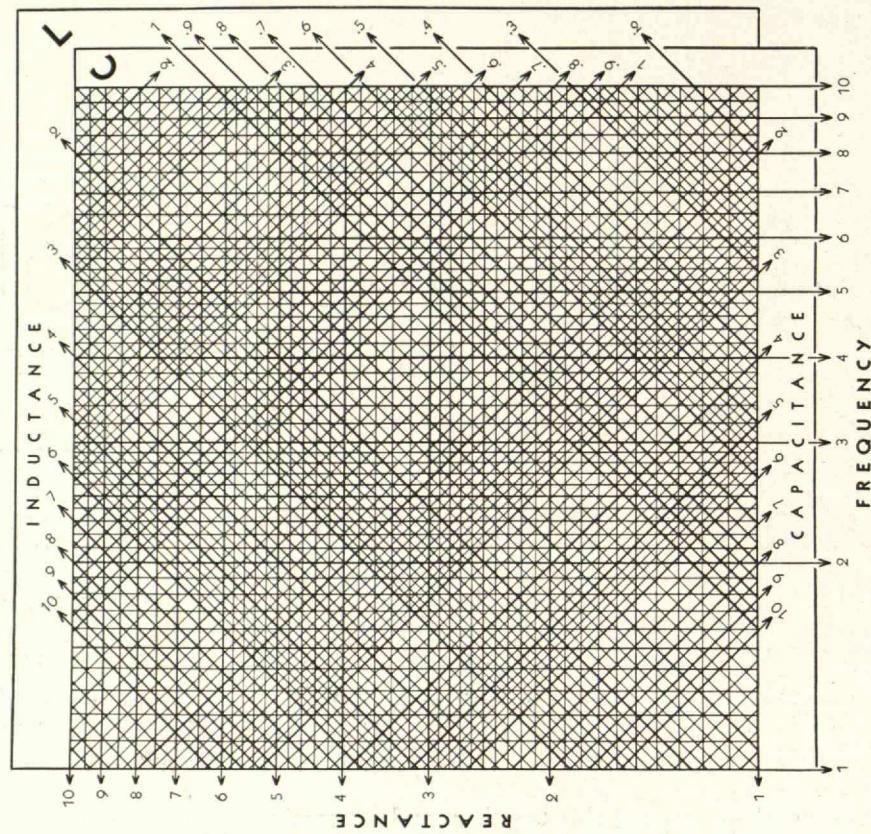


FIG. 2

TO FIND RESONANT FREQUENCY

Enter the slanting lines for the given inductance and capacitance. Project downward and read resonant frequency from the bottom scale. Corresponding scales (upper or lower) must be used throughout.

Example: The sample point indicated (Figure 1) corresponds to a frequency of about 700 kc and an inductance of 300 μh, or a capacitance of 100 pF, giving in either case a reactance of about 2000 ohms. The resonant frequency of a circuit containing these values of inductance and capacitance is, of course, 700 kc, approximately.

USE OF FIGURE 2

Figure 2 is used to obtain additional precision of reading but does not place the decimal point which must be located from a preliminary entry on Figure 1. Since the chart necessarily requires two logarithmic decades for inductance and capacitance for every single decade of frequency and reactance, unless the correct decade for L and C is chosen, the calculated values of reactance and frequency will be in error by a factor of 3.16.

Example: (Continued) The reactance corresponding to 500 μh or 100 μf is 2,230 ohms at 712 kc, their resonant frequency.

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